DIRECT TESTIMONY, APPENDICES AND EXHIBITS OF

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ON BEHALF OF

THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF

DOCKET NO. 2021-153-S

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is David J. Garrett. My business address is 101 Park Avenue, Suite 1125, Oklahoma City, Oklahoma 73102.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am the managing member of Resolve Utility Consulting, PLLC. I am an independent consultant specializing in public utility regulation.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I received a B.B.A. degree with a major in Finance, an M.B.A. degree, and a J.D. from the University of Oklahoma. I worked in private legal practice for several years before working as assistant general counsel at the Oklahoma Corporation Commission ("OK Commission") in 2011. At the OK Commission, I worked in the Office of General Counsel in regulatory proceedings. In 2012, I worked for the Public Utility Division as a regulatory analyst providing testimony in regulatory proceedings. After leaving the OK Commission, I formed Resolve Utility Consulting, PLLC, where I have represented numerous consumer groups and state agencies in utility regulatory proceedings, primarily in the areas of cost of capital and depreciation. I am a Certified Depreciation Professional with the Society of Depreciation Professionals. I am also a Certified Rate of Return Analyst with the Society of Utility and Regulatory Financial Analysts. A more complete

description of my qualifications and regulatory experience is included in my curriculum vitae.[1]

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of the South Carolina Office of Regulatory Staff ("ORS").

Q. DESCRIBE THE PURPOSE AND SCOPE OF YOUR TESTIMONY IN THIS PROCEEDING.

A. The primary purpose of my testimony is to provide my opinion on the estimated cost of capital and authorized[2] rate of return recommendation for Palmetto Wastewater Reclamation, Inc. ("PWR" or the "Company"). I am responding to the Direct Testimony of PWR witness Paul R. Moul.

Q. PLEASE DESCRIBE THE ORGANIZATION OF YOUR TESTIMONY.

A. In the executive summary below, I provide an overview of cost of capital issues, my recommendations, and my response to PWR's testimony on these issues. In the sections that follow, I discuss the legal standards governing the awarded return issue as well as the general concepts involved in estimating the cost of equity. I provide detailed analysis of the Discounted Cash Flow ("DCF") Model, the Capital Asset Pricing Model ("CAPM"), including my results for these models and my responses to witness Moul's results. I also address capital structure, which is a key component to the cost of capital, and cost of debt.

[1] Exhibit DJG-1.

[2] The terms "authorized" and "awarded" are used interchangeably in my testimony when talking about returns on equity and rates of return.

II. EXECUTIVE SUMMARY

Q. PLEASE SUMMARIZE YOUR RECOMMENDATION TO THE COMMISSION.

A. My testimony can be distilled to the following recommendations:

- The Public Service Commission of South Carolina ("Commission") should reject the Company's proposed return on equity ("ROE") of 10.95% as excessive and unsupported. My objective cost of equity analysis shows that PWR's cost of equity is about 7.1% within a range of 6.3% to 8.0%.

- The legal standards governing the ROE do not mandate that the awarded ROE equate to the result of a particular financial model, but rather that it be reasonable under the circumstances. In my professional opinion, it is not appropriate to use an awarded ROE significantly above a regulated utility's cost of equity; however, that concept is even more important under these unique circumstances. Accordingly, I recommend the Commission award PWR an authorized ROE of 8.9%. Although 8.9% is still clearly above PWR's market-based cost of equity estimate, it represents a gradual yet meaningful move towards market-based cost of equity.

- I recommend the Commission reject PWR's proposed capital structure consisting of 40% debt and 60% equity.[3] This equity-rich capital structure has the effect of increasing capital costs above a reasonable level. An objective analysis of PWR's optimal capital structure indicates a debt ratio [redacted] which is the same debt ratio of PWR's parent company, SouthWest Water Company ("SWWC"). In addition, the average debt ratio of the proxy group is 50%. Thus, PWR's proposed debt ratio is far too low to be considered reasonable. I recommend an imputed capital structure consisting of 50% debt and 50% equity, which is equal to the proxy group in this case.

- PWR's estimated cost of debt of 3.79% is reasonable for this proceeding.

- The Commission should consider adopting several standard financial protections known as "ring-fencing" provisions to help insulate PWR's customers from any undue and additional risks imposed on them resulting from the recent acquisition of PWR's parent company, Ni South Carolina,

[3] The Company is proposing an exact capital structure of 40.08% long-term debt and 59.92% common equity. In my testimony, I will refer to the rounded figures for debt and equity of 40% and 60%, respectively.

Inc. (then Ni South Carolina, LLC), by South Carolina Utility Systems, Inc. ("SCUS"), a subsidiary of SWWC.[4]

My adjustments to the Company's proposed ROE and capital structure equate to an overall weighted average rate of return of 6.35%, as shown in the table below.[5]

Figure 1:
Weighted Average Rate of Return Proposal

Capital Component	Proposed Ratio	Cost Rate	Weighted Cost
Debt	50.0%	3.79%	1.90%
Common Equity	50.0%	8.90%	4.45%
Total	100.0%		6.35%

The details supporting my proposed adjustments are discussed further in my testimony.

A. Overview and Background

Q. PLEASE EXPLAIN THE CONCEPT AND SIGNIFICANCE OF THE COST OF CAPITAL.

A. The term cost of capital, or WACC,[6] refers to the weighted average cost of the components within a company's capital structure, including the costs of both debt and equity. The three primary components of a company's WACC include the following:

[4] In my testimony, I collectively refer to this transaction as "the Acquisition." References to PWR's parent company refer to SWWC unless otherwise noted.

[5] *See also* Exhibit DJG-16.

[6] The terms cost of capital and WACC are synonymous and used interchangeably throughout this testimony.

1. Cost of Debt

2. Cost of Equity

3. Capital Structure

Determining the cost of debt is relatively straight-forward. Interest payments on bonds are contractual, embedded costs that are generally calculated by dividing total interest payments by the book value of outstanding debt. Determining the cost of equity, on the other hand, is more complex. Unlike the known, contractual, and embedded cost of debt, there is not any explicitly quantifiable "cost" of equity. Instead, the cost of equity must be estimated through various financial models. Cost of capital is expressed as a weighted average because it is based upon a company's relative levels of debt and equity, as defined by the particular capital structure of that company. The basic WACC equation used in regulatory proceedings is presented as follows:

Equation 1:
Weighted Average Cost of Capital

$$WACC = \left(\frac{D}{D+E}\right)C_D + \left(\frac{E}{D+E}\right)C_E$$

where: $WACC$ = *weighted average cost of capital*
D = *book value of debt*
C_D = *embedded cost of debt capital*
E = *book value of equity*
C_E = *market-based cost of equity capital*

Companies in the competitive market often use their WACC as the discount rate to determine the value of capital projects, so it is important that this figure be estimated accurately.

Q. HOW DO EXPERTS TYPICALLY ASSESS THE COST OF EQUITY FOR UTILITY COMPANIES?

A. Investors, company managers, and academics around the world have used models, such as the CAPM and DCF, to closely estimate cost of equity for many years. In utility proceedings, experts use the same types of models to estimate the cost of equity for utility companies. Conceptually, however, the cost of equity is different than the authorized ROE.

In the field of finance, analysts consider the stock prices of companies with comparable risk to estimate the expected investor return on an investment in a similarly situated company when evaluating the cost of equity. The return on equity, on the other hand, is a mathematical equation taking into account net income and shareholders' equity that is, effectively, a fall out of these two data points. These two terms are often used interchangeably in regulatory proceedings, but the methods by which they are estimated are vastly different. Further, it is important to note that the ROEs authorized by commissions reflect the analyses and recommendations of rate of return analysts and are intended to reflect a balance between consumer needs and investor expectations. Thus, a utility is permitted the opportunity to earn up to its allowed ROE, while its actual ROE for any given period is determined by the financial equation provided above. As described in greater detail later in my testimony, I differentiate between the two terms by conducting DCF and CAPM analyses to estimate the cost of equity for PWR and discussing a reasonable return on equity that, if adopted by the Commission, would adhere to the just and reasonable standards established nearly a century ago.

B. Recommendation

Q. PLEASE SUMMARIZE YOUR ROE RECOMMENDATION TO THE COMMISSION IN THE CONTEXT OF LEGAL PRECEDENT IN REGULATORY PROCEEDINGS.

A. Pursuant to the legal and technical standards guiding this issue, the awarded ROE should be based on, or reflective of, the utility's cost of equity. PWR's estimated cost of equity is about 7.1% when using reasonable inputs. However, legal standards do not mandate the awarded ROE be set exactly equal to the cost of equity. Rather, in *Federal Power Commission v. Hope Natural Gas Co*. ("*Hope*"), the U.S. Supreme Court found that, although the awarded return should be based on a utility's cost of capital, the "end result" should be just and reasonable:

> We held in Federal Power Commission v. Natural Gas Pipeline Co., supra, that the Commission was not bound to the use of any single formula or combination of formulae in determining rates. Its rate-making function, moreover, involves the making of "pragmatic adjustments." And when the Commission's order is challenged in the courts, the question is whether that order "viewed in its entirety" meets the requirements of the Act. Under the statutory standard of "just and reasonable" it is the result reached not the method employed which is controlling. It is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry under the Act is at an end.[7]

Therefore, I recommend the Commission award PWR an ROE of 8.9%. In my opinion, an awarded ROE that is set too far above a regulated utility's cost of equity runs

[7] *See Federal Power Commission v. Hope Natural Gas Co*., 320 U.S. 591, 602-03 (1944) (internal citations omitted). Here, the Court states that it is not mandating the various permissible ways in which the rate of return may be determined, but instead indicates that the end result should be just and reasonable. This is sometimes called the "end result" doctrine.

the risk of being at odds with the standards set forth in *Hope* and *Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia* ("*Bluefield*").[8]

Q. IF 8.9% EXCEEDS PWR'S ACTUAL COST OF EQUITY, HOW CAN IT STILL BE CONSIDERED A JUST AND REASONABLE RESULT?

A. The ratemaking concept of "gradualism," though usually applied from ratepayers' standpoint to minimize rate shock, can also be applied illustratively to shareholders. An awarded return of 7.1% in any current rate proceeding may represent a substantial decrease from historic ROEs. However, as I prove later in my testimony, awarded ROEs in many jurisdictions, including South Carolina, exceed market-based costs of equity for utilities. While generally reducing awarded ROEs for utilities would move awarded returns closer to market-based costs, I believe it is advisable to do so gradually. One of the primary reasons PWR's actual cost of equity is so low is because PWR is a low-risk investment. In general, utility stocks are low-risk investments because movements in their stock prices are not volatile. If the Commission were to make a significant, sudden change in the awarded ROE anticipated by stockholders, it could have the undesirable effect of notably increasing the Company's risk profile, which could be in contravention to the *Hope* Court's "end result" doctrine. An awarded ROE of 8.9% represents a good balance between the Supreme Court's indications that awarded ROEs should be based on cost, while also recognizing that the end result must be just and reasonable under the circumstances. An awarded ROE of 8.9% represents a relatively gradual, yet decisive move toward PWR's

[8] 262 U.S. 679 (1923).

market-based cost of equity, while still providing PWR's shareholders with the opportunity to earn a return that is more than 100 basis points above PWR's market-based cost of equity (8.9% vs. 7.1%).

Q. PLEASE DISCUSS YOUR COST OF EQUITY ESTIMATE OF 7.1% IN THE CONTEXT OF A RECENT SOUTH CAROLINA SUPREME COURT OPINION.

A. In September of this year, the South Carolina Supreme Court affirmed the portion of the Commission's Order in the most recent Blue Granite Water Company ("Blue Granite") rate case[9] in which the Commission authorized an ROE of 7.46%.[10] While an authorized ROE of 7.46% is lower than an average of awarded ROEs for various utilities around the country, it is undoubtedly much more reflective of the market-based cost of equity for utilities in general. The conclusion to affirm the Commission's decision is detailed in the South Carolina Supreme Court Opinion. In that Opinion, the Court found that the Commission has the ability to consider other factors in addition to the cost of equity when making its awarded ROE.[11] Pertinently, the Court found that the Commission could consider the overall decreased cost of equity for utility companies and a decline in investor expectations of equity returns and risk premiums.[12] These two factors should be considered in any cost of equity analysis for a utility company, and I have considered these factors as part of my analyses in this case.

[9] *See* Commission Docket No. 2019-290-WS.

[10] *In re Application of Blue Granite Water Company for Approval to Adjust Rate Schedules and Increase Rates*, Opinion No. 28055 (S.C. Sept. 1, 2021); Commission Docket No. 2019-290-WS.

[11] *See* Footnote 6 of Opinion No. 28055, South Carolina Supreme Court (Sept. 1, 2021), p. 8.

[12] *Id*.

Q. IS THERE A BASIC MODEL YOU CAN USE TO ASSESS THE OVERALL ACCURACY OF YOUR COST OF EQUITY ESTIMATE FOR PWR IN THE CONTEXT OF THE BLUE GRANITE OPINION?

A. Yes. We can estimate a "ceiling" below which the cost of equity for low-risk companies (i.e., companies with betas of less than 1.0) must be. This ceiling can be estimated by adding the risk-free rate to the equity risk premium. As discussed later in my testimony, the current risk-free rate is about 2%, and the current equity risk premium is about 5.5%. Thus, our estimated ceiling for the cost of equity of low-beta stocks is 7.5%. Similarly, my estimate of 7.1% for the cost of equity of PWR is very reasonable considering these findings as well as the detailed evidence presented in my testimony. Likewise, in consideration of this market "ceiling," the 7.46% ROE awarded in the Blue Granite case is also reflective of market-based cost of equity.

C. Response to PWR's Testimony

Q. PLEASE PROVIDE AN OVERVIEW OF THE PROBLEMS YOU HAVE IDENTIFIED WITH PWR'S TESTIMONY REGARDING COST OF EQUITY, CAPITAL STRUCTURE, AND THE RESULTING AWARDED ROE.

A. Witness Moul proposes a return on equity of 10.95%.[13] His recommendation is based on the CAPM, DCF, and other risk premium models. However, several of his key assumptions and inputs to these models violate fundamental, widely accepted tenets in finance and valuation. I find several aspects of witness Moul's approach and resulting

[13] Direct Testimony of Paul R. Moul p. 1, line 19.

recommendations to be problematic, including the leverage adjustment used in his DCF Model and CAPM, along with his size adjustment. In addition, witness Moul's risk premium model overstates the risk-free rate and equity risk premium. Finally, witness Moul conducts a comparable earnings model that overstates the indicated cost of equity for PWR. These issues are further discussed in my testimony.

III. LEGAL STANDARDS AND THE AWARDED RETURN

Q. DISCUSS THE LEGAL STANDARDS GOVERNING THE AWARDED RATE OF RETURN ON CAPITAL INVESTMENTS FOR REGULATED UTILITIES.

A. In *Wilcox v. Consolidated Gas Co. of New York*, the U.S. Supreme Court first addressed the meaning of a fair rate of return for public utilities.[14] The Court found that "the amount of risk in the business is a most important factor" in determining the appropriate allowed rate of return.[15] As referenced earlier, in two subsequent landmark cases, the Court set forth the standards for determining an authorized rate of return on capital investments for public utilities. First, in *Bluefield*, the Court held:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public. . . but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.[16]

[14] *Wilcox v. Consolidated Gas Co. of New York*, 212 U.S. 19 (1909).

[15] *Id.* at 48.

[16] *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679, 692–93 (1923).

Then, in *Hope*, the Court expanded on the guidelines set forth in *Bluefield* and stated:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[17]

The cost of capital models I have employed in this case are designed to be in accordance with the foregoing legal standards.

Q. IS IT IMPORTANT THAT THE AWARDED RATE OF RETURN BE BASED ON PWR'S ACTUAL COST OF CAPITAL?

A. Yes. The U.S. Supreme Court in *Hope* makes it clear that the allowed return should be based on the actual cost of capital. Moreover, the awarded return must also be fair, just, and reasonable under the circumstances of each case. Among the circumstances that must be considered in each case are the broad economic and financial impacts to the cost of equity and awarded return caused by market forces and other factors. Scholars agree that the actual cost of capital must be considered:

[17] *Federal Power Commission v. Hope Natural Gas Co*., 320 U.S. 591, 603 (1944) (emphasis added) (internal citations omitted).

> Since by definition the cost of capital of a regulated firm represents precisely the expected return that investors could anticipate from other investments while bearing no more or less risk, and since investors will not provide capital unless the investment is expected to yield its opportunity cost of capital, the correspondence of the definition of the cost of capital with the court's definition of legally required earnings appears clear.[18]

The models I have employed in this case closely estimate PWR's true cost of equity. If the Commission sets the awarded return based on my lower and more reasonable rate of return, it will comply with the U.S. Supreme Court's standards, allow PWR to maintain its financial integrity, and achieve reasonable returns for its investors. On the other hand, if the Commission sets the allowed rate of return much higher than the true cost of capital, as requested by PWR, it will result in an inappropriate transfer of wealth from ratepayers to shareholders.[19]

Q. WHAT DOES THIS LEGAL STANDARD MEAN FOR DETERMINING THE AWARDED RETURN AND THE COST OF CAPITAL?

A. The awarded return and the cost of capital are different but related concepts. On the one hand, the legal and technical standards encompassing this issue require that the awarded return reflect the true cost of capital. Yet on the other hand, the two concepts differ in that the legal standards do not mandate that awarded returns exactly match the cost of capital. Instead, awarded returns are set through the regulatory process and may be

[18] A Lawrence Kolbe, James A. Read, Jr. & George R. Hall, *The Cost of Capital: Estimating the Rate of Return for Public Utilities* 21 (The MIT Press 1984).

[19] Roger A. Morin, *New Regulatory Finance* 23–24 (Public Utilities Reports, Inc. 2006) (1994) ("[I]f the allowed rate of return is greater than the cost of capital, capital investments are undertaken and investors' opportunity costs are more than achieved. Any excess earnings over and above those required to service debt capital accrue to the equity holders, and the stock price increases. In this case, the wealth transfer occurs from ratepayers to shareholders.").

influenced by various factors other than objective market drivers. By contrast, the cost of capital should be evaluated objectively and be closely tied to economic realities, such as stock prices, dividends, growth rates, and, most importantly, risk. The cost of capital can be estimated by financial models used by firms, investors, and academics around the world for decades. The problem is, with respect to regulated utilities, there has been a trend in which awarded returns fail to closely track with market-based cost of capital, as further discussed below.

Q. DESCRIBE THE ECONOMIC IMPACT THAT OCCURS WHEN THE AWARDED RETURN STRAYS TOO FAR FROM THE U.S. SUPREME COURT'S TIME-HONORED COST OF EQUITY STANDARDS.

A. When the authorized ROE is set far above the cost of equity, it runs the risk of violating the U.S. Supreme Court's standards. This has the effect of diverting dollars from ratepayers for their internal or business uses that would otherwise support the local or state economy to the utility's shareholders at large. Moreover, establishing an awarded return that far exceeds true cost of capital effectively prevents the awarded returns from changing along with economic conditions. This is especially true given the fact that regulators tend to be influenced by the awarded returns in other jurisdictions, regardless of the various unknown factors influencing those awarded returns. If regulators rely too heavily on the awarded returns from other jurisdictions, they can create a cycle over time that bears little relation to the market-based cost of equity. In fact, this is exactly what we have observed since 1990. This is yet another reason why it is crucial for regulators to put more emphasis on the target utility's actual cost of equity than on the awarded returns from other

jurisdictions. Awarded returns may be influenced by settlements and other factors that are not based on true market conditions. In contrast, the true cost of equity as estimated through objective models is not influenced by these factors but is instead driven by market-based factors.

Q. CAN YOU ILLUSTRATE AND PROVIDE A COMPARISON OF THE RELATIONSHIP BETWEEN AWARDED UTILITY RETURNS AND MARKET COST OF EQUITY SINCE 1990?

A. Yes. As shown in the figure below, awarded returns for electric and gas utilities have been above the average required market return since 1990.[20] Because utility stocks are consistently far less risky than the average stock in the marketplace, the cost of equity for utility companies is less than the market cost of equity.

To illustrate this fact, the graph in the figure below shows three trend lines.[21] The top two lines are the average annual awarded returns since 1990 for U.S. regulated electric and gas utilities. The bottom line is the required market return over the same period. As discussed in more detail later in my testimony, the required market return is essentially the return that investors would require if they invested in the entire market and, as such, the required market return is essentially the cost of equity of the entire market. Since it is undisputed that utility stocks are less risky than the average stock in the market, then the utilities' cost of equity must be less than the market cost of equity.[22] Thus, awarded returns

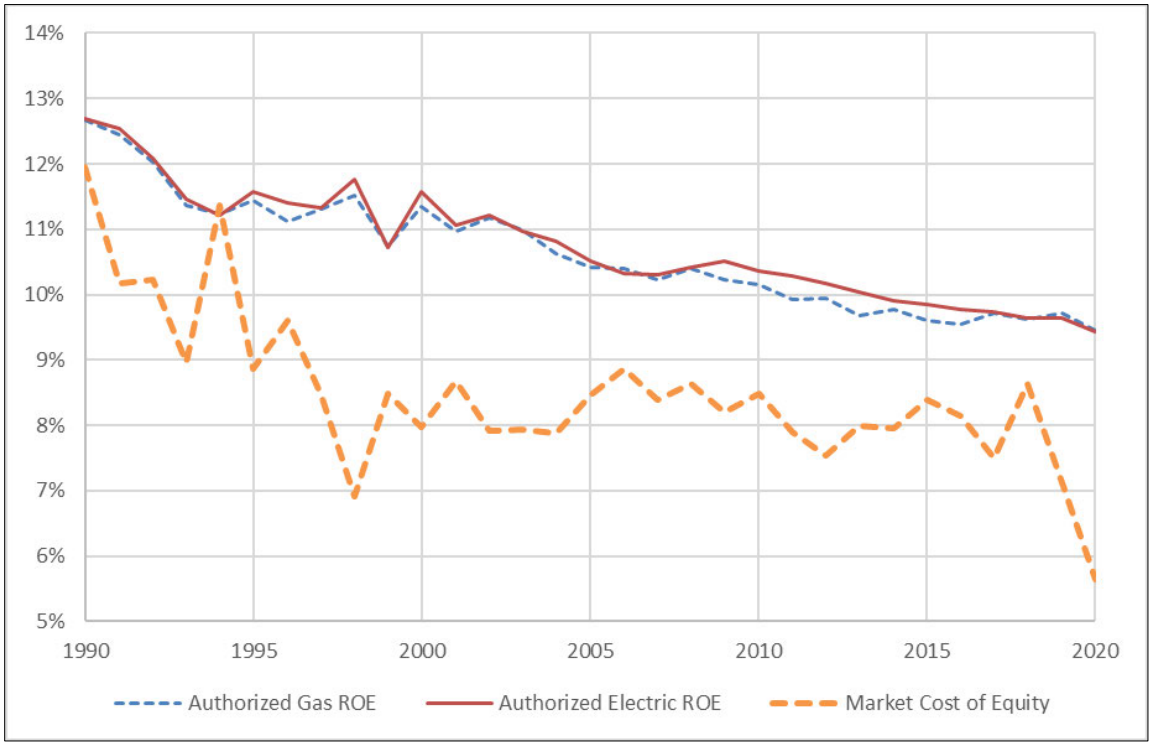
[20] Exhibit DJG-13.

[21] *See* Exhibit DJG-13 for data sources.

[22] This fact can be objectively measured through a term called "beta," as discussed later in the testimony. Utility betas are less than one, which means utility stocks are less risky than the "average" stock in the market.

(the solid line) should generally be below the market cost of equity (the dotted line), since awarded returns are supposed to be based on true cost of equity.

Figure 2:
Awarded ROEs vs. Market Cost of Equity

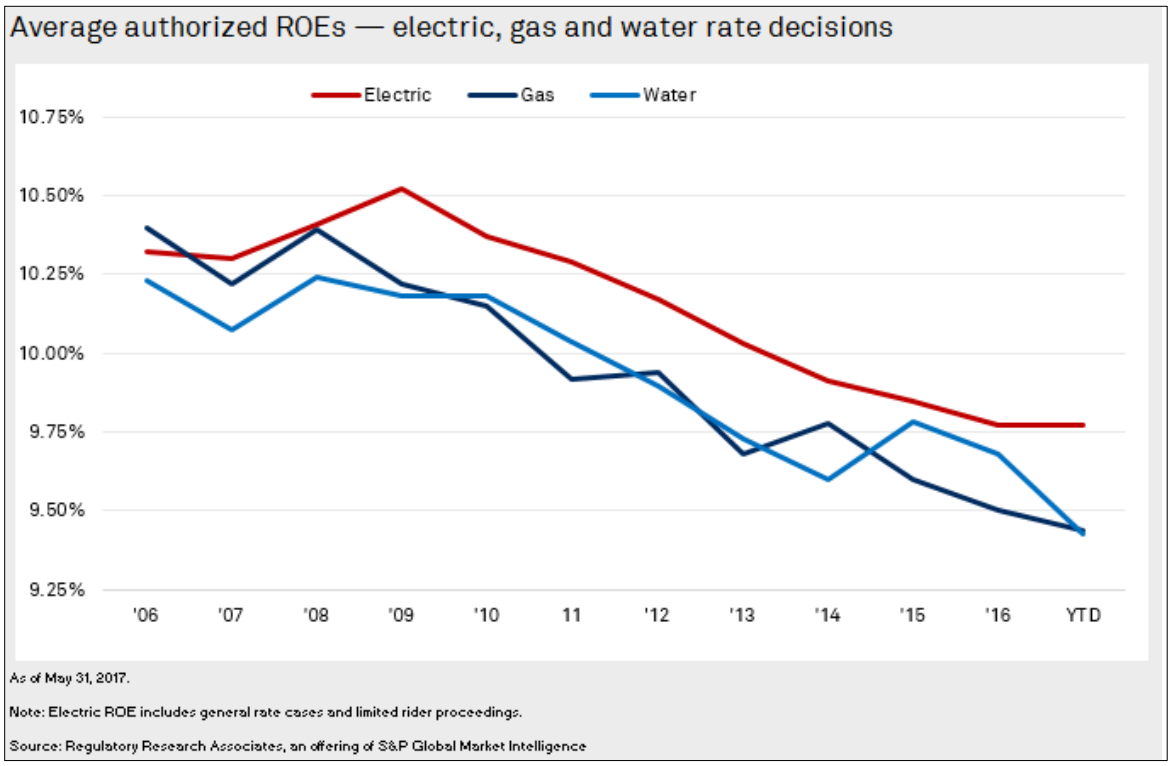


Notwithstanding the data in this graph, awarded ROEs have been consistently above the market cost of equity for many years. Also as shown in this graph, since 1990, there was only one year in which the average awarded ROE was below the market cost of equity. In 1994, regulators awarded ROEs that were the closest to utilities' market-based cost of equity. In my opinion, when awarded ROEs for utilities are below the market cost of equity, regulators more closely conform to the standards set forth by *Hope* and *Bluefield*.

Q. DOES THIS CONCEPT ALSO APPLY TO REGULATED WATER UTILITIES?

A. Yes. Like regulated electric and gas utilities, water utilities are also less risky than the average stock in the market portfolio. We can objectively measure this fact through water utility betas.[23] As shown in the graph below, the average authorized ROEs for water utilities have generally tracked with those of gas utilities.[24]

Figure 3:
Awarded ROEs vs. Market Cost of Equity



[23] *See* Exhibit DJG-8. The concept of beta will be discussed further in my testimony; however, since the average beta of the proxy group is less than 1.0, we have an objective way to determine that if PWR were publicly traded, the return required by its equity investors would be less than the return required on the market portfolio.

[24] S&P Global Market Intelligence, Regulatory Research Associates, as of May 31, 2017.

Comparing this figure with Figure 2 above, we can see that authorized ROEs for water utilities have also exceeded the market cost of equity. Again, the cost of equity for a regulated utility, including water utilities, should be below the market cost of equity. In the first half of 2017, the average authorized ROE for water utilities was about 9.4%.[25] As demonstrated in my testimony, the highest reasonable estimate for PWR's cost of equity is about 8.0%.

Q. HAVE OTHER ANALYSTS COMMENTED ON THIS NATIONAL PHENOMENON OF AWARDED ROES EXCEEDING MARKET-BASED COST EQUITY FOR UTILITIES?

A. Yes. In his article published in Public Utilities Fortnightly in 2016, Steve Huntoon observed that even though utility stocks are less risky than the stocks of competitive industries, utility stocks have nonetheless outperformed the broader market.[26] Specifically, Mr. Huntoon notes the following three points which lead to a problematic conclusion:

1. Jack Bogle, the founder of Vanguard Group and a Wall Street legend, provides rigorous analysis that the long-term total return for the broader market will be around 7 percent going forward. Another Wall Street legend, Professor Burton Malkiel, corroborates that 7 percent in the latest edition of his seminal work, A Random Walk Down Wall Street.

2. Institutions like pension funds are validating the first point by piling on risky investments to try and get to a 7.5 percent total return, as reported by the Wall Street Journal.

[25] S&P Global Market Intelligence, *Water Rate Case Activity: How It Ebbs and Flows*, June 23, 2017. https://www.spglobal.com/marketintelligence/en/news-insights/research/water-rate-case-activity-how-it-ebbs-and-flows

[26] Steve Huntoon, "Nice Work If you can Get It," Public Utilities Fortnightly (Aug. 2016).

3. Utilities are being granted returns on equity around 10 percent.[27]

Other scholars have also observed that awarded ROEs have not appropriately tracked with declining interest rates over the years, and that excessive awarded ROEs have negative economic impacts. In a white paper issued in 2017, Charles S. Griffey stated:

> The "risk premium" being granted to utility shareholders is now higher than it has ever been over the last 35 years. Excessive utility ROEs are detrimental to utility customers and the economy as a whole. From a societal standpoint, granting ROEs that are higher than necessary to attract investment creates an inefficient allocation of capital, diverting available funds away from more efficient investments. From the utility customer perspective, if a utility's awarded and/or achieved ROE is higher than necessary to attract capital, customers pay higher rates without receiving any corresponding benefit.[28]

It is interesting that both Mr. Huntoon and Mr. Griffey use the word "sticky" in their articles to describe the fact that awarded ROEs have declined at a much slower rate than interest rates and other economic factors resulting in a decline in capital costs and expected returns on the market. It is not hard to see why this phenomenon of "sticky" ROEs has occurred. Because awarded ROEs are often based primarily on a comparison with other awarded ROEs around the country, the average awarded returns effectively fail to adapt to true market conditions, and regulators seem reluctant to deviate from the average. Once utilities and regulatory commissions become accustomed to awarding rates of return higher than market conditions actually require, this trend becomes difficult to reverse. The fact is, utility stocks are less risky than the average stock in the market, and

[27] *Id*.

[28] Charles S. Griffey, "When 'What Goes Up' Does Not Come Down: Recent Trends in Utility Returns," White Paper (February 2017).

thus, awarded ROEs should be less than the expected return on the market. However, that is rarely the case. My proposal assists the Commission in "see[ing] the gap between allowed returns and cost of capital,"[29] and reconciling this issue in an equitable manner.[30]

Q. PLEASE SUMMARIZE THE LEGAL STANDARDS GOVERNING THE AWARDED ROE ISSUE.

A. The Commission should strive to move the awarded return to a level more closely aligned with PWR's actual, market-derived cost of capital while keeping in mind the following two legal principles outlined below.

1. Risk is the most important factor when determining the awarded return. The awarded return should be commensurate with those returns on investments of corresponding risk.

The legal standards articulated in *Hope* and *Bluefield* demonstrate that the U.S. Supreme Court understands one of the most basic, fundamental concepts in financial theory: the more (or less) risk an investor assumes, the more (or less) return the investor requires. Since utility stocks are low risk, the return required by equity investors should be relatively low. I have used financial models to closely estimate PWR's cost of equity, and these financial models account for risk. The cost of equity models confirm the industry experiences relatively low levels of risk by producing relatively low cost of equity results. In turn, the awarded ROE in this case should reflect PWR's relatively low market risk.

[29] Leonard Hyman & William Tilles, "Don't Cry for Utility Shareholders, America," Public Utilities Fortnightly (October 2016).

[30] Although the articles cited in this section were not specifically discussing water utilities, as demonstrated in the figures and discussion preceding this section, the authorized ROEs for water utilities have also exceeded the cost of equity for the market portfolio.

2. The awarded return should be sufficient to ensure financial soundness and integrity under efficient management.

Regulatory commissions should strive to set utilities' returns based on actual market conditions to promote prudent and efficient management and minimize economic waste.

IV. GENERAL CONCEPTS AND METHODOLOGY

Q. PLEASE DISCUSS YOUR APPROACH TO ESTIMATING THE COST OF EQUITY IN THIS CASE.

A. While a competitive firm must estimate its own cost of capital to assess the profitability of competing capital projects, regulators determine a utility's cost of capital to establish a fair rate of return. The legal standards set forth above do not include specific guidelines regarding the models that must be used to estimate the cost of equity for utilities. Over the years, however, regulatory commissions have consistently relied on several models. The models I have employed in this case have been the two most widely used and accepted in regulatory proceedings for many years. The specific inputs and calculations for these models are described in more detail below.

Q. PLEASE EXPLAIN WHY YOU USED MULTIPLE MODELS TO ESTIMATE THE COST OF EQUITY.

A. These models attempt to measure the return on equity required by investors by estimating several different inputs. It is preferable to use multiple models because the results of any one model may contain a degree of imprecision, especially depending on the reliability of the inputs used at the time of conducting the model. The models should be generally accepted in the field of finance regarding their ability to estimate cost of equity.

By using multiple models, the analyst can compare the results of the models and look for outlying results and inconsistencies. Likewise, if multiple models produce a similar result, it may indicate a narrower range for the cost of equity estimate.

Q. PLEASE DISCUSS THE BENEFITS OF CHOOSING A PROXY GROUP OF COMPANIES IN CONDUCTING COST OF CAPITAL ANALYSES.

A. The cost of equity models in this case can be used to estimate the cost of capital of any individual, publicly traded company. There are advantages, however, to conducting cost of capital analysis on a proxy group of companies that are comparable to the target company. First, it is better to assess the financial soundness of a utility by comparing it to a group of other financially sound utilities. Second, using a proxy group provides more reliability and confidence in the overall results because there is a larger sample size. Finally, the use of a proxy group is often a pure necessity when the target company is a subsidiary that is not publicly traded. This is because the financial models used to estimate the cost of equity require information from publicly traded firms, such as stock prices and dividends.

Q. DESCRIBE THE PROXY GROUP YOU SELECTED IN THIS CASE.

A. In this case, I chose to use the same proxy group used by witness Moul. There could be reasonable arguments made for the inclusion or exclusion of a particular company in a proxy group; however, the cost of equity results are influenced far more by the underlying assumptions and inputs to the various financial models than the composition of

the proxy group.[31] By using the same proxy group, we can remove a relatively insignificant variable from the equation and focus on the primary factors driving PWR's cost of equity estimate.

V. RISK AND RETURN CONCEPTS

Q. DISCUSS THE GENERAL RELATIONSHIP BETWEEN RISK AND RETURN.

A. Risk is among the most important factors for the Commission to consider when determining the allowed return. Thus, it is necessary to understand the relationship between risk and return. There is a direct relationship between risk and return: the more (or less) risk an investor assumes, the larger (or smaller) return the investor will demand. There are two primary types of risk: firm-specific risk and market risk. Firm-specific risk affects individual companies, while market risk affects all companies in the market to varying degrees.

Q. DISCUSS THE DIFFERENCES BETWEEN FIRM-SPECIFIC RISK AND MARKET RISK.

A. Firm-specific risk affects individual companies, rather than the entire market. For example, a competitive firm might overestimate customer demand for a new product, resulting in reduced sales revenue. This is an example of a firm-specific risk called "project risk."[32] There are several other types of firm-specific risks, including: (1) "financial risk" – the risk that equity investors of leveraged firms face as residual claimants on earnings;

[31] Exhibit DJG-2.

[32] Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 62–63 (3rd ed., John Wiley & Sons, Inc. 2012).

(2) "default risk" – the risk that a firm will default on its debt securities; and (3) "business risk" – which encompasses all other operating and managerial factors that may result in investors realizing less than their expected return in that particular company. While firm-specific risk affects individual companies, market risk affects all companies in the market to varying degrees. Examples of market risk include interest rate risk, inflation risk, and the risk of major socio-economic events. When there are changes in these risk factors, they affect all firms in the market to some extent.[33]

Analysis of the U.S. market in 2001 provides a good example for contrasting firm-specific risk and market risk. During that year, Enron Corp.'s stock fell from $80 per share to less than $1 per share by the end of November. The company filed bankruptcy at the end of the year. If an investor's portfolio had held only Enron stock at the beginning of 2001, this irrational investor would have lost the entire investment by the end of the year due to assuming the full exposure of Enron's firm-specific risk (in that case, imprudent management). On the other hand, a rational, diversified investor who invested the same amount of capital in a portfolio holding every stock in the S&P 500 would have had a much different result that year. The rational investor would have been relatively unaffected by the fall of Enron because his or her portfolio included about 499 other stocks. Each of those stocks, however, would have been affected by various market risk factors that occurred that year. Thus, the rational investor would have incurred a relatively minor loss

[33] *See* Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 149 (9th ed., McGraw-Hill/Irwin 2013).

due to market risk factors, while the irrational investor would have lost everything due to firm-specific risk factors.

Q. CAN EQUITY INVESTORS REASONABLY MINIMIZE FIRM-SPECIFIC RISK?

A. Yes. A fundamental concept in finance is that firm-specific risk can be eliminated through diversification.[34] If someone irrationally invested all his or her funds in one firm, he or she would be exposed to all the firm-specific risk and the market risk inherent in that single firm. Rational investors, however, are risk-averse and seek to eliminate risk they can control. Investors can eliminate firm-specific risk by adding more stocks to their portfolio through a process called "diversification." There are two reasons why diversification eliminates firm-specific risk.

First, each stock in a diversified portfolio represents a much smaller percentage of the overall portfolio than it would in a portfolio of just one or a few stocks. Thus, any firm-specific action that changes the stock price of one stock in the diversified portfolio will have only a small impact on the entire portfolio.[35]

The second reason why diversification eliminates firm-specific risk is that the effects of firm-specific actions on stock prices can be either positive or negative for each stock. Thus, in large, diversified portfolios, the net effect of these positive and negative firm-specific risk factors will be essentially zero and will not affect the value of the overall

[34] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 179–80 (3rd ed., South Western Cengage Learning 2010).

[35] *See* Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 64 (3rd ed., John Wiley & Sons, Inc. 2012).

portfolio.[36] Firm-specific risk is also called "diversifiable risk" because it can be easily eliminated through diversification.

Q. IS IT WELL-KNOWN AND ACCEPTED THAT, BECAUSE FIRM-SPECIFIC RISK CAN BE EASILY ELIMINATED THROUGH DIVERSIFICATION, THE MARKET DOES NOT REWARD SUCH RISK THROUGH HIGHER RETURNS?

A. Yes. Because investors eliminate firm-specific risk through diversification, they know they cannot expect a higher return for assuming the firm-specific risk in any one company. Thus, the risks associated with an individual firm's operations are not rewarded by the market. In fact, firm-specific risk is also called "unrewarded" risk for this reason. Market risk, on the other hand, cannot be eliminated through diversification. Because market risk cannot be eliminated through diversification, investors expect a return for assuming this type of risk. Market risk is also called "systematic risk." Scholars recognize the fact that market risk, or systematic risk, is the only type of risk for which investors expect a return for bearing:

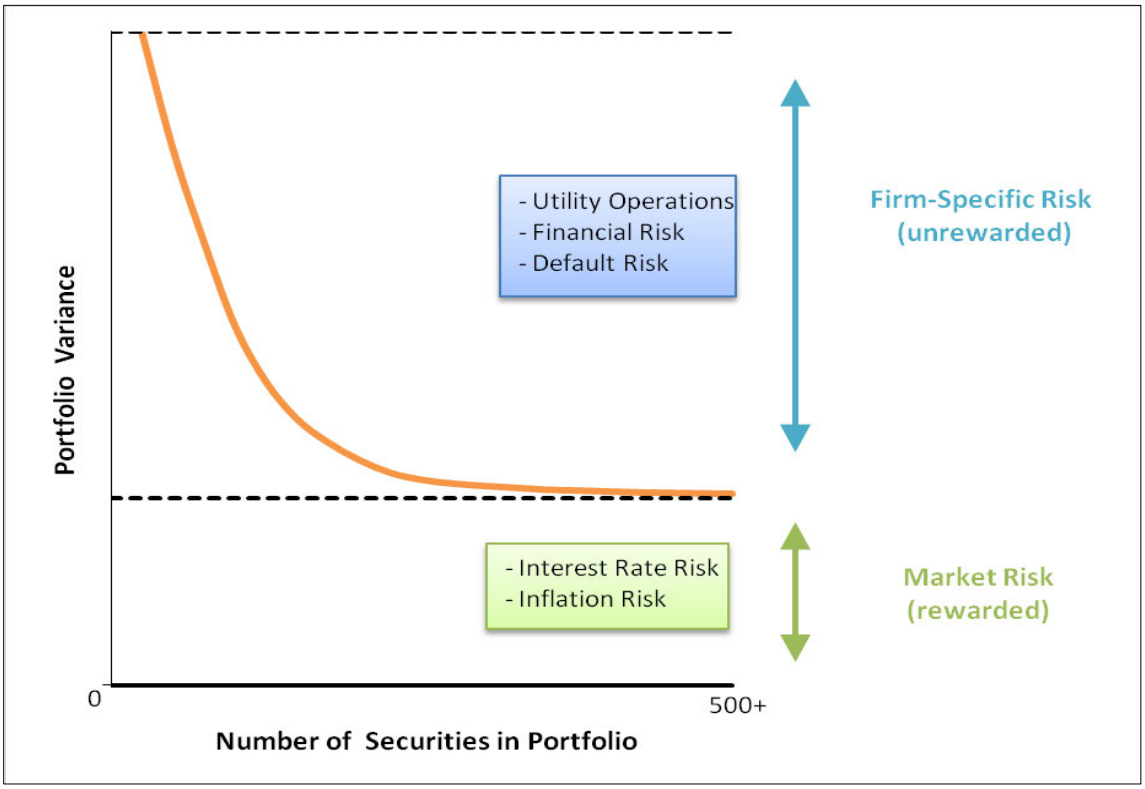
> If investors can cheaply eliminate some risks through diversification, then we should not expect a security to earn higher returns for risks that can be eliminated through diversification. Investors can expect compensation only for bearing systematic risk (i.e., risk that cannot be diversified away).[37]

These important concepts are illustrated in the figure below. Some form of this figure is found in many financial textbooks.

[36] *See* Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 64 (3rd ed., John Wiley & Sons, Inc. 2012).

[37] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 180 (3rd ed., South Western Cengage Learning 2010) (emphasis added).

Figure 4:
Effects of Portfolio Diversification



This figure shows that as stocks are added to a portfolio, the amount of firm-specific risk is reduced until it is essentially eliminated. No matter how many stocks are added, however, there remains a certain level of fixed market risk. The level of market risk will vary from firm to firm. Market risk is the only type of risk that is rewarded by the market and is thus the primary type of risk the Commission should consider when determining the allowed return.

Q. PLEASE DESCRIBE HOW MARKET RISK IS MEASURED.

A. Investors who want to eliminate firm-specific risk must hold a fully diversified portfolio. To determine the amount of risk that a single stock adds to the overall market portfolio, investors measure the covariance between a single stock and the market portfolio.

The result of this calculation is called "beta."[38] Beta represents the sensitivity of a given security to the market as a whole. The market portfolio of all stocks has a beta equal to one. Stocks with betas greater than 1.0 are relatively more sensitive to market risk than the average stock. For example, if the market increases (or decreases) by 1.0%, a stock with a beta of 1.5 will, on average, increase (or decrease) by 1.5%. In contrast, stocks with betas of less than 1.0 are less sensitive to market risk, such that if the market increases (or decreases) by 1.0%, a stock with a beta of 0.5 will, on average, only increase (or decrease) by 0.5%. Thus, stocks with low betas are relatively insulated from market conditions. The beta term is used in the CAPM to estimate the cost of equity, which is discussed in more detail later.[39]

Q. ARE PUBLIC UTILITIES CHARACTERIZED AS DEFENSIVE FIRMS THAT HAVE LOW BETAS, HAVE LOW MARKET RISK, AND ARE RELATIVELY INSULATED FROM OVERALL MARKET CONDITIONS?

A. Yes. Although market risk affects all firms in the market, it affects different firms to varying degrees. Firms with high betas are affected more than firms with low betas, which is why firms with high betas are riskier. Stocks with betas greater than one are generally known as "cyclical stocks." Firms in cyclical industries are sensitive to recurring patterns of recession and recovery known as the "business cycle."[40] Thus, cyclical firms

[38] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 180–81 (3rd ed., South Western Cengage Learning 2010).

[39] Though it will be discussed in more detail later, Exhibit DJG-8 shows that the average beta of the proxy group was less than 1.0. This confirms the well-known concept that utilities are relatively low-risk firms.

[40] *See* Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 382 (9th ed., McGraw-Hill/Irwin 2013).

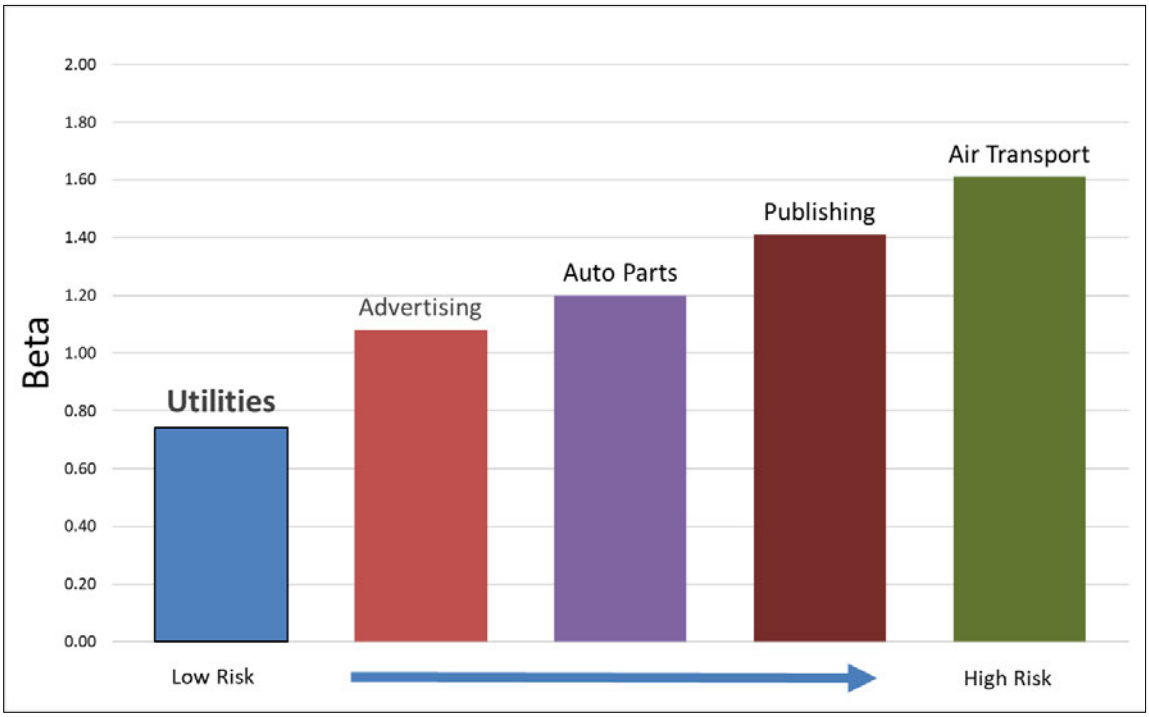
are exposed to a greater level of market risk. Securities with betas less than one, on the other hand, are known as "defensive stocks." Companies in defensive industries, such as public utility companies, "will have low betas and performance that is comparatively unaffected by overall market conditions."[41] In fact, financial textbooks often use utility companies as prime examples of low-risk, defensive firms.[42] The figure below compares the betas of several industries and illustrates that the utility industry is one of the least risky industries in the U.S. market.[43]

[41] Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 383 (9th ed., McGraw-Hill/Irwin 2013).

[42] *See e.g.,* Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 382 (9th ed., McGraw-Hill/Irwin 2013); *see also* Aswath Damodaran, Investment Valuation: Tools and Techniques for Determining the Value of Any Asset 196 (3rd ed., John Wiley & Sons, Inc. 2012).

[43] *See* Betas by Sector (US) at http://pages.stern.nyu.edu/~adamodar/. The exact beta calculations are not as important as illustrating the well-known fact that utilities are low-risk companies. The fact that the utility industry is one of the lowest risk industries in the country should not change from year to year.

Figure 5:
Beta by Industry



The fact that utilities are defensive firms that are exposed to little market risk is beneficial to society. When the business cycle enters a recession, consumers can be assured that their utility companies will be able to maintain normal business operations and provide safe and reliable service under prudent management. Likewise, utility investors can be confident that utility stock prices will not fluctuate widely. So, while it is preferable for utilities to be defensive firms that experience little market risk and are relatively insulated from market conditions, this should also be appropriately reflected in PWR's awarded return.

VI. DCF ANALYSIS

Q. DESCRIBE THE DCF MODEL.

A. The DCF Model is based on a fundamental financial model called the "dividend discount model," which maintains that the value of a security is equal to the present value of the future cash flows it generates. Cash flows from common stock are paid to investors in the form of dividends. There are several variations of the DCF Model. These versions, along with other formulas and theories related to the DCF Model are discussed in more detail in Appendix A. For this case, I chose to use the Quarterly Approximation DCF Model because it accounts for the quarterly growth of dividends (as opposed to annual growth). I also used this variation of the DCF Model in the interest of reasonableness, as it produces the highest cost of equity estimates compared with the other DCF Model variations.

Q. DESCRIBE THE INPUTS TO THE DCF MODEL.

A. There are three primary inputs in the DCF Model: (1) stock price; (2) dividend; and (3) the long-term growth rate. The stock prices and dividends are known inputs based on recorded data, while the growth rate projection must be estimated. The formula is presented as follows:

Equation 2:
Quarterly Approximation Discounted Cash Flow Model

$$K = \left[\frac{d_0(1+g)^{1/4}}{P_0} + (1+g)^{1/4}\right]^4 - 1$$

where: K = *discount rate / required return*
d_0 = *current quarterly dividend per share*
P_0 = *stock price*
g = *expected growth rate of future dividends*

I discuss each of these inputs separately below.

A. Stock Price

Q. HOW DID YOU DETERMINE THE STOCK PRICE INPUT OF THE DCF MODEL?

A. For the stock price (P_0), I used a 30-day average of stock prices for each company in the proxy group.[44] Analysts sometimes rely on average stock prices for longer periods (e.g., 60, 90, or 180 days). According to the efficient market hypothesis, however, markets reflect all relevant information available at a particular time, and prices adjust instantaneously to the arrival of new information.[45] Past stock prices, in essence, reflect outdated information. The DCF Model used in utility rate cases is a derivation of the dividend discount model, which is used to determine the current value of an asset. Thus, according to the dividend discount model and the efficient market hypothesis, the value for

[44] Exhibit DJG-3.

[45] *See* Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, Vol. 25, No. 2 The Journal of Finance 383 (1970).

the "P_0" term in the DCF Model should technically be the current stock price, rather than an average.

Q. WHY DID YOU USE A 30-DAY AVERAGE FOR THE CURRENT STOCK PRICE INPUT?

A. Using a short-term average of stock prices for the current stock price input adheres to market efficiency principles while avoiding any irregularities that may arise from using a single current stock price. In the context of a utility rate proceeding there is a significant length of time from when an application is filed, and testimony is due. Choosing a current stock price for one particular day could raise a separate issue concerning which day was chosen to be used in the analysis. In addition, a single stock price on a particular day may be unusually high or low. It is arguably ill-advised to use a single stock price in a model that is ultimately used to set rates for several years, especially if a stock is experiencing some volatility. Thus, it is preferable to use a short-term average of stock prices, which represents a good balance between adhering to well-established principles of market efficiency while avoiding any unnecessary contentions that may arise from using a single stock price on a given day. The stock prices I used in my DCF analysis are based on 30-day averages of adjusted closing stock prices for each company in the proxy group.[46]

[46] Exhibit DJG-3. Adjusted closing prices, rather than actual closing prices, are ideal for analyzing historical stock prices. The adjusted price provides an accurate representation of the firm's equity value beyond the mere market price because it accounts for stock splits and dividends.

B. Dividend

Q. DESCRIBE HOW YOU DETERMINED THE DIVIDEND INPUT OF THE DCF MODEL.

A. The dividend term in the Quarterly Approximation DCF Model is the current quarterly dividend per share (d_0). I obtained the most recent quarterly dividend paid for each proxy company.[47] The Quarterly Approximation DCF Model assumes that the company increases its dividend payments each quarter. Thus, the model assumes that each quarterly dividend is greater than the previous one by $(1 + g)^{0.25}$. This expression could be described as the dividend quarterly growth rate, where the term "g" is the growth rate and the exponential term "0.25" signifies one quarter of the year.

Q. DOES THE QUARTERLY APPROXIMATION DCF MODEL RESULT IN THE HIGHEST COST OF EQUITY IN THIS CASE RELATIVE TO OTHER DCF MODELS, ALL ELSE HELD CONSTANT?

A. Yes. The Quarterly Approximation DCF Model I employed in this case results in a higher DCF cost of equity estimate than the annual or semi-annual DCF Models due to the quarterly compounding of dividends inherent in the model. In essence, the Quarterly Approximation DCF Model I used results in the highest cost of equity estimate, all else held constant.

[47] Exhibit DJG-4. Nasdaq Dividend History, https://www nasdaq.com/market-activity/quotes/dividend-history.

Q. ARE THE STOCK PRICE AND DIVIDEND INPUTS FOR EACH PROXY COMPANY A SIGNIFICANT ISSUE IN THIS CASE?

A. No. Although my stock price and dividend inputs are more recent than those used by witness Moul, there is not a significant difference between them because utility stock prices and dividends are generally stable for utilities. This is another reason that cost of capital models such as the CAPM and the DCF Model are well-suited to be used for utilities. The differences between my DCF Model and witness Moul's DCF Model are primarily driven by differences in our growth rate estimates, which are further discussed below.

C. Growth Rate

Q. PLEASE SUMMARIZE THE GROWTH RATE INPUT IN THE DCF MODEL.

A. The most critical input in the DCF Model is the growth rate. Unlike the stock price and dividend inputs, the growth rate input (g) must be estimated. As a result, the growth rate is often the most contentious DCF input in utility rate cases. The DCF model used in this case is based on the constant growth valuation model. Under this model, a stock is valued by the present value of its future cash flows in the form of dividends. Before future cash flows are discounted by the cost of equity, however, they must be "grown" into the future by a long-term growth rate. As stated above, one of the inherent assumptions of this model is that these cash flows in the form of dividends grow at a constant rate forever. Thus, the growth rate term in the constant growth DCF model is often called the "constant," "stable," or "terminal" growth rate. For young, high-growth firms, estimating the growth rate to be used in the model can be especially difficult, and may require the use of multi-

stage growth models. For mature, low-growth firms such as utilities, however, estimating the terminal growth rate is more transparent. The growth term of the DCF Model is one of the most important, yet apparently most misunderstood, aspects of cost of equity estimations in utility regulatory proceedings. Therefore, I have devoted a more detailed explanation of this issue in the following sections, which are organized as follows:

(1) The Various Determinants of Growth

(2) Reasonable Estimates for Long-Term Growth

(3) Quantitative vs. Qualitative Determinants of Utility Growth: Circular References, "Flatworm" Growth, and the Problem with Analysts' Growth Rates

(4) Growth Rate Recommendation

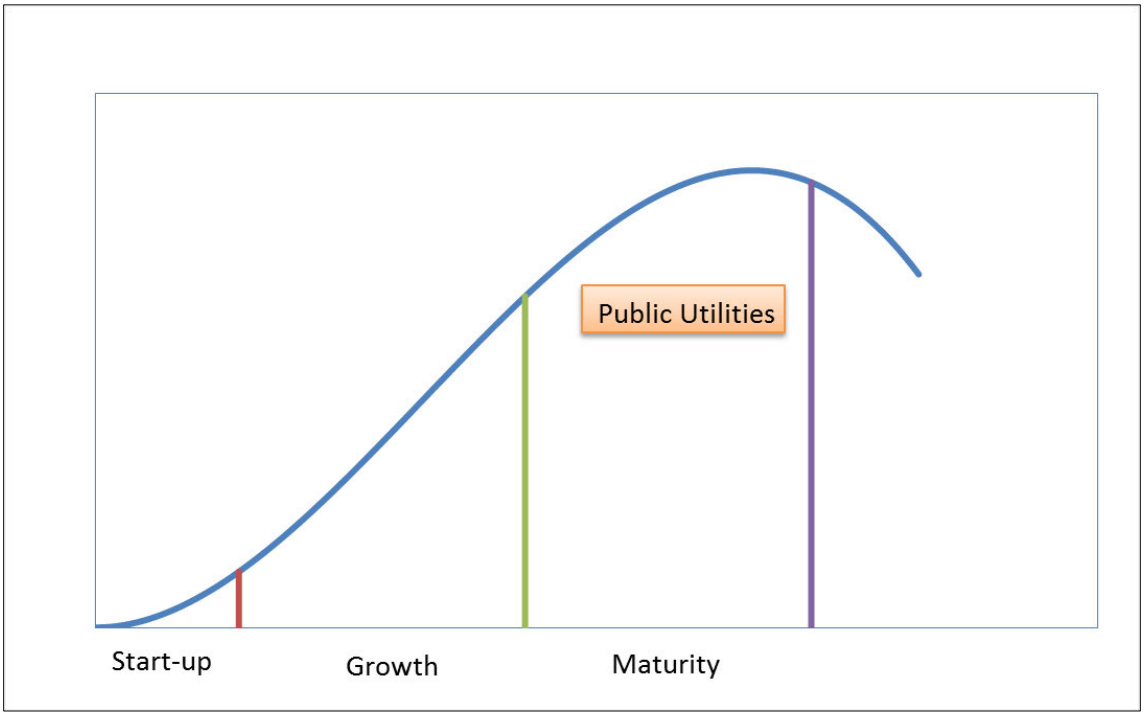
Q. DESCRIBE THE VARIOUS DETERMINANTS OF GROWTH THAT MIGHT BE CONSIDERED FOR THE TERMINAL GROWTH RATE INPUT IN THE DCF MODEL.

A. Although the DCF Model directly considers the growth of dividends, there are a variety of growth determinants that should be considered when estimating growth rates. It should be noted that these various growth determinants are used primarily to determine the short-term growth rates in multi-stage DCF models. For utility companies, it is necessary to focus primarily on long-term growth rates, which are discussed in the following section. That is not to say that these growth determinants cannot be considered when estimating long-term growth; however, as discussed below, long-term growth must be constrained much more than short-term growth, especially for young firms with high growth opportunities.

Q. DESCRIBE WHAT IS MEANT BY LONG-TERM GROWTH.

A. In order to make the DCF Model a viable, practical model, an infinite stream of future cash flows must be estimated and then discounted back to the present. Otherwise, each annual cash flow would have to be estimated separately. Some analysts use "multi-stage" DCF Models to estimate the value of high-growth firms through two or more stages of growth, with the final stage of growth being constant. However, it is not necessary to use multi-stage DCF Models to analyze the cost of equity of regulated utility companies. This is because regulated utilities are already in their "terminal," low growth stage. Unlike most competitive firms, the growth of regulated utilities is constrained by physical service territories and limited primarily by ratepayer and load growth within those territories. The figure below illustrates the well-known business/industry life-cycle pattern.

Figure 6:
Industry Life Cycle



In an industry's early stages, there are ample opportunities for growth and profitable reinvestment. In the maturity stage however, growth opportunities diminish, and firms choose to pay out a larger portion of their earnings in the form of dividends instead of reinvesting them in operations to pursue further growth opportunities. Once a firm is in the maturity stage, it is not necessary to consider higher short-term growth metrics in multi-stage DCF Models; rather, it is sufficient to analyze the cost of equity using a stable growth DCF Model with one terminal, long-term growth rate.

Q. IS IT TRUE THAT THE AGGREGATE GROWTH RATE OF THE ECONOMY COULD BE SEEN AS A LIMITING FACTOR FOR THE TERMINAL GROWTH RATE IN THE DCF MODEL?

A. Yes. A fundamental concept in finance is that no firm can grow forever at a rate higher than the growth rate of the economy in which it operates.[48] Thus, the terminal growth rate used in the DCF Model should not exceed the aggregate economic growth rate. This is especially true when the DCF Model is conducted on public utilities because these firms have defined service territories. As stated by Dr. Damodaran: "[i]f a firm is a purely domestic company, either because of internal constraints . . . or external constraints (such as those imposed by a government), the growth rate in the domestic economy will be the limiting value."[49]

[48] *See* Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 306 (3rd ed., John Wiley & Sons, Inc. 2012).

[49] Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 306 (3rd ed., John Wiley & Sons, Inc. 2012).

In fact, it is reasonable to assume that a regulated utility would grow at a rate that is less than the U.S. economic growth rate. Unlike competitive firms, which might increase their growth by launching a new product line, franchising, or expanding into new and developing markets, utility operating companies with defined service territories cannot do any of these things to grow. Gross Domestic Product ("GDP") is one of the most widely used measures of economic production and is used to measure aggregate economic growth. According to the Congressional Budget Office's Budget Outlook, the long-term forecast for nominal U.S. GDP growth is about 4%, which includes an inflation rate of 2%.[50] For mature companies in mature industries, such as utility companies, the terminal growth rate will likely fall between the expected rate of inflation and the expected rate of nominal GDP growth. Thus, PWR's terminal growth rate is between 2% and 4%.

Q. DO WATER UTILITIES HAVE UNIQUE GROWTH OPPORTUNITIES THAT MOST ELECTRIC AND GAS UTILITIES DO NOT HAVE?

A. Yes. Water utilities are in a unique position to adopt growth strategies which include the potential acquisition of many smaller water and wastewater systems from various municipalities and other localized government entities. My analysis of the dividend yields of the proxy group shows that these companies are likely retaining more capital in order to pursue these types of growth strategies.

[50] Congressional Budget Office Long-Term Budget Outlook, https://www.cbo.gov/publication/51580.

Q. GIVEN THESE UNIQUE GROWTH OPPORTUNITIES, DID YOU CONSIDER SOME OF THE PROJECTED GROWTH RATES OUTLINED IN WITNESS MOUL'S TESTIMONY WHEN DETERMINING THE GROWTH RATE TO USE IN YOUR DCF MODEL?

A. Yes. In this case, I considered some of the historical and projected growth rates outlined in witness Moul's testimony. While these growth rates are higher than what should typically be used for the terminal growth rate in the DCF Model, I considered them in this case given the water proxy group's unique growth opportunities relative to electric and gas utilities.

Q. DESCRIBE THE GROWTH RATE INPUT USED IN YOUR DCF MODEL.

A. I considered various qualitative determinants of growth for PWR, along with the maximum allowed growth rate under basic principles of finance and economics. The following chart in the figure below shows three of the long-term growth determinants discussed in this section.[51]

[51] Exhibit DJG-5.

Figure 7:
Terminal Growth Rate Determinants

Terminal Growth Determinants	Rate
Nominal GDP	3.8%
Real GDP	1.8%
Inflation	2.0%
Projected Growth Rate	6.3%
Risk Free Rate	1.9%
Highest	**6.3%**

For the long-term growth rate in my DCF Model, I selected the maximum, reasonable long-term growth rate of 6.3%, which means my model assumes that PWR's qualitative growth in earnings will exceed the nominal growth rate of the entire U.S. economy over the long run by more than three times, which is a conservative approach. This growth rate is the IBES/First Call prospective five-year earnings growth rate stated in witness Moul's testimony.[52]

Q. PLEASE DESCRIBE THE FINAL RESULTS OF YOUR DCF MODEL.

A. I used the Quarterly Approximation DCF Model discussed above to estimate PWR's cost of equity capital. I obtained an average of reported dividends and stock prices from the proxy group, and I used a reasonable terminal growth rate estimate for the

[52] Direct Testimony of Paul R. Moul, p. 21, lines 14-17.

Company. My DCF Model cost of equity estimate for PWR is 8.0%.[53] This result is at the higher end of a cost of equity range that could be considered reasonable, given the fact that it incorporates terminal growth rates that are notably higher than U.S. GDP growth. This DCF result is also notably higher than the results of the market-based CAPM, which is further discussed below.

D. Response to Witness Moul's DCF Model

Q. WITNESS MOUL'S DCF MODEL YIELDED A NOTABLY HIGHER RESULT. DID YOU FIND ANY PROBLEMS WITH HIS ANALYSIS?

A. Yes. Witness Moul's DCF Model produced a cost of equity result of 10.41%.[54] Witness Moul's DCF result is unreasonably high primarily because of his leverage adjustment, which is based on the Hamada formula.

Q. WHAT IS THE PREMISE OF THE HAMADA FORMULA?

A. The Hamada formula can be used to analyze changes in a firm's cost of capital as it adds or reduces financial leverage, or debt, in its capital structure by starting with an "unlevered" beta and then "relevering" the beta at different debt ratios. As leverage increases, equity investors bear increasing amounts of risk, leading to higher betas. Before the effects of financial leverage can be accounted for, however, the effects of leverage must first be removed, which is accomplished through the Hamada formula. The Hamada formula for unlevering beta is stated as follows:[55]

[53] Exhibit DJG-6.

[54] Exhibit PRM-1, Sch. 1.

[55] Damodaran *supra* n. 18, at 197. This formula was originally developed by Hamada in 1972.

Equation 3:
Hamada Formula

$$\beta_U = \frac{\beta_L}{\left[1 + (1 - T_c)\left(\frac{D}{E}\right)\right]}$$

where: β_U = *unlevered beta (or "asset" beta)*
β_L = *average levered beta of proxy group*
T_C = *corporate tax rate*
D = *book value of debt*
E = *book value of equity*

Using this equation, the beta for the firm can be unlevered, and then "relevered" based on various debt ratios (by rearranging this equation to solve for β_L).

Q. DID WITNESS MOUL APPLY THE HAMADA FORMULA CORRECTLY?

A. No. Witness Moul's application of the Hamada formula is incorrect. I conducted the Hamada Model and present my results in my exhibits.[56] Using the Company's proposed capital structure and a tax rate of 21% (the same used by witness Moul), I calculate an unlevered beta of 0.51. When that beta is relevered to my proposed debt ratio of 50%, I calculate a cost of equity of 7.0%, which is very close to my overall cost of equity estimate of 7.1% for PWR. In other words, while the Hamada formula can be a valuable exercise in certain applications, it does not have any meaningful impact on a fair awarded ROE in this case, especially since my recommended capital structure for PWR is the same as those of the proxy group. In other words, the proxy group betas published by Value Line essentially reflect the capital structures of the proxy group (having a debt ratio of 50%). When we unlever the proxy betas and then relever them back to a 50% debt ratio,

[56] Exhibit DJG-17.

there is essentially no change in the beta. Yet witness Moul distorts this process in an attempt to justify adding nearly 100 basis points to his DCF cost of equity estimate. Witness Moul's leverage adjustment is entirely inappropriate and should be rejected by the Commission.

VII. CAPM ANALYSIS

Q. PLEASE DESCRIBE THE CAPM.

A. The CAPM is a market-based model founded on the principle that investors expect higher returns for incurring additional risk.[57] The CAPM estimates this expected return. The various assumptions, theories, and equations involved in the CAPM are discussed further in Appendix B. Using the CAPM to estimate the cost of equity of a regulated utility is consistent with the legal standards governing the fair rate of return. The U.S. Supreme Court has recognized that "the amount of risk in the business is a most important factor" in determining the allowed rate of return,[58] and that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."[59] The CAPM is a useful model because it directly considers the amount of risk inherent in a business. It is arguably the strongest of the models usually presented in rate cases because, unlike the DCF Model, the CAPM directly measures the most important component of a fair rate of return analysis – risk.

[57] William F. Sharpe, *A Simplified Model for Portfolio Analysis* 277–93 (Management Science IX 1963).

[58] *Wilcox*, 212 U.S. at 48.

[59] *Hope Natural Gas Co*., 320 U.S. at 603.

Q. DESCRIBE THE INPUTS FOR THE CAPM.

A. The basic CAPM equation requires only three inputs to estimate the cost of equity: (1) the risk-free rate; (2) the beta coefficient; and (3) the equity risk premium ("ERP"). Here is the CAPM formula:

Equation 4:
Basic CAPM

Cost of Equity = Risk-free Rate + (Beta × Equity Risk Premium)

Each input is discussed separately below.

A. The Risk-Free Rate

Q. PLEASE EXPLAIN THE RISK-FREE RATE.

A. The first term in the CAPM is the risk-free rate (R_F). The risk-free rate is simply the level of return investors can achieve without assuming any risk. The risk-free rate represents the bare minimum return that any investor would require on a risky asset. Even though no investment is technically void of risk, investors often use U.S. Treasury securities to represent the risk-free rate because they accept that those securities essentially contain no default risk. The Treasury issues securities with different maturities, including short-term Treasury Bills, intermediate-term Treasury Notes, and long-term Treasury Bonds.

Q. IS IT PREFERABLE TO USE THE YIELD ON LONG-TERM TREASURY BONDS FOR THE RISK-FREE RATE IN THE CAPM?

A. Yes. In valuing an asset, investors estimate cash flows over long periods of time. Common stock is viewed as a long-term investment, and the cash flows from dividends are assumed to last indefinitely. Thus, short-term Treasury Bill yields are rarely used in the

CAPM to represent the risk-free rate. Short-term rates are subject to greater volatility and thus can lead to unreliable estimates. Instead, long-term Treasury bonds are usually used to represent the risk-free rate in the CAPM. I considered a 30-day average of daily Treasury yield curve rates on 30-year Treasury Bonds in my risk-free rate estimate, which resulted in a risk-free rate of 1.91%.[60]

B. The Beta Coefficient

Q. HOW IS THE BETA COEFFICIENT USED IN THIS MODEL?

A. As discussed above, beta represents the sensitivity of a given security to movements in the overall market. The CAPM states that in efficient capital markets, the expected risk premium on each investment is proportional to its beta. Recall that a security with a beta greater (or less) than one is more (or less) risky than the market portfolio. An index such as the S&P 500 Index is used as a proxy for the market portfolio. The historical betas for publicly traded firms are published by various institutional analysts. Beta may also be calculated through a linear regression analysis, which provides additional statistical information about the relationship between a single stock and the market portfolio. As discussed above, beta also represents the sensitivity of a given security to the market as a whole. The market portfolio of all stocks has a beta equal to one. Stocks with betas greater than 1.0 are relatively more sensitive to market risk than the average stock. For example, if the market increases (or decreases) by 1.0%, a stock with a beta of 1.5 will, on average, increase (or decrease) by 1.5%. In contrast, stocks with betas of less than 1.0 are less

[60] Exhibit DJG-7.

sensitive to market risk. For example, if the market increases (or decreases) by 1.0%, a stock with a beta of 0.5 will, on average, only increase (or decrease) by 0.5%.

Q. DESCRIBE THE SOURCE FOR THE BETAS YOU USED IN YOUR CAPM ANALYSIS.

A. I used betas recently published by Value Line Investment Survey. The beta for each proxy company used in witness Moul's (and my) proxy group is less than 1.0. Thus, we have an objective measure to prove the well-known concept that utility stocks are less risky than the average stock in the market. While there is evidence suggesting that betas published by sources such as Value Line may actually overestimate the risk of utilities (and thus overestimate the CAPM), I used the betas published by Value Line to be conservative.[61]

C. The ERP

Q. DESCRIBE THE ERP.

A. The final term of the CAPM is the ERP, which is the required return on the market portfolio less the risk-free rate ($R_M - R_F$). In other words, the ERP is the level of return investors expect above the risk-free rate in exchange for investing in risky securities. Many experts would agree that "the single most important variable for making investment decisions is the equity risk premium."[62] Likewise, the ERP is arguably the single most important factor in estimating the cost of capital in this matter. There are three basic

[61] Exhibit DJG-8; *see also* Appendix B for a more detailed discussion of raw beta calculations and adjustments.

[62] Elroy Dimson, Paul Marsh & Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* 4 (Princeton University Press 2002).

methods that can be used to estimate the ERP: (1) calculating a historical average; (2) taking a survey of experts; and (3) calculating the implied ERP. I will discuss each method in turn, noting advantages and disadvantages of these methods.

1. Historical Average

Q. PLEASE DESCRIBE THE HISTORICAL ERP.

A. The historical ERP may be calculated by simply taking the difference between returns on stocks and returns on government bonds over a certain period of time. Many practitioners rely on the historical ERP as an estimate for the forward-looking ERP because it is easy to obtain. However, there are disadvantages to relying on the historical ERP.

Q. WHAT ARE THE LIMITATIONS OF RELYING SOLELY ON A HISTORICAL AVERAGE TO ESTIMATE THE CURRENT OR FORWARD-LOOKING ERP?

A. Many investors use the historic ERP because it is convenient and easy to calculate. What matters in the CAPM model, however, is not the actual risk premium from the past, but rather the current and forward-looking risk premium.[63] Some investors may think that a historic ERP provides some indication of the prospective risk premium; however, there is empirical evidence to suggest the prospective, forward-looking ERP is actually lower than the historical ERP. In a landmark publication on risk premiums around the world, *Triumph of the Optimists*,[64] the authors suggest through extensive empirical research that

[63] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 330 (3rd ed., South Western Cengage Learning 2010).

[64] Elroy Dimson, Paul Marsh & Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* (Princeton University Press 2002).

the prospective ERP is lower than the historical ERP.[65] This is due in large part to what is known as "survivorship bias" or "success bias" – a tendency for failed companies to be excluded from historical indices.[66] From their extensive analysis, the authors make the following conclusion regarding the prospective ERP: "[t]he result is a forward-looking, geometric mean risk premium for the United States . . . of around 2½ to 4 percent and an arithmetic mean risk premium . . . that falls within a range from a little below 4 to a little above 5 percent."[67] Indeed, these results are lower than many reported historical risk premiums. Other noted experts agree:

> The historical risk premium obtained by looking at U.S. data is biased upwards because of survivor bias. . . . The true premium, it is argued, is much lower. This view is backed up by a study of large equity markets over the twentieth century (*Triumph of the Optimists*), which concluded that the historical risk premium is closer to 4%.[68]

Regardless of the variations in historic ERP estimates, many scholars and practitioners agree that simply relying on a historic ERP to estimate the risk premium going forward is not ideal. Fortunately, "a naïve reliance on long-run historical averages is not the only approach for estimating the expected risk premium."[69]

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[65] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 194 (3rd ed., South Western Cengage Learning 2010).

[66] Elroy Dimson, Paul Marsh & Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* 34 (Princeton University Press 2002).

[67] Elroy Dimson, Paul Marsh & Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* 194 (Princeton University Press 2002).

[68] Aswath Damodaran, *Equity Risk Premiums: Determinants, Estimation and Implications – The 2015 Edition* 17 (New York University 2015).

[69] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 330 (3rd ed., South Western Cengage Learning 2010).

Q. DID YOU RELY ON THE HISTORICAL ERP AS PART OF YOUR CAPM ANALYSIS IN THIS CASE?

A. No. Due to the limitations of this approach, I relied on the ERP reported in expert surveys and the implied ERP method discussed below.

2. Expert Surveys

Q. DESCRIBE THE EXPERT SURVEY APPROACH TO ESTIMATING THE ERP.

A. As its name implies, the expert survey approach to estimating the ERP involves conducting a survey of experts including professors, analysts, chief financial officers, and other executives around the country and asking them what they think the ERP is. The IESE Business School conducts a periodic survey that asks experts around the country about their opinions on the ERP. Their 2021 expert survey reported an average ERP of 5.6%.[70]

3. Implied ERP

Q. DESCRIBE THE IMPLIED ERP APPROACH.

A. The third method of estimating the ERP is arguably the best. The implied ERP relies on the stable growth model proposed by Gordon, often called the "Gordon Growth Model," which is a basic stock valuation model that has been widely used in finance for many years.[71] This model is a mathematical derivation of the DCF Model. In fact, the

[70] Pablo Fernandez, Pablo Linares & Isabel F. Acin, *Market Risk Premium used in 171 Countries in 2016: A Survey with 6,932 Answers*, at 3 (IESE Business School 2015), copy available at http://www.valumonics.com/wp-content/uploads/2017/06/Discount-rate-Pablo-Fern%C3%A1ndez.pdf. IESE Business School is the graduate business school of the University of Navarra. IESE offers Master of Business Administration (MBA), Executive MBA and Executive Education programs. IESE is consistently ranked among the leading business schools in the world.

[71] Myron J. Gordon and Eli Shapiro, *Capital Equipment Analysis: The Required Rate of Profit* 102–10 (Management Science Vol. 3, No. 1 Oct. 1956).

underlying concept in both models is the same: the current value of an asset is equal to the present value of its future cash flows. Instead of using this model to determine the discount rate of one company, it can be used to determine the discount rate for the entire market by substituting the inputs of the model. Specifically, instead of using the current stock price (P_0), I use the current value of the S&P 500 (V_{500}). Similarly, instead of using the dividends of a single firm, I consider the dividends paid by the entire market.

Additionally, potential dividends should be considered. In other words, stock buybacks should be considered in addition to paid dividends, as stock buybacks represent another way for the firm to transfer free cash flow to shareholders. Focusing on dividends alone without considering stock buybacks could understate the cash flow component of the model, and ultimately understate the implied ERP. The market dividend yield plus the market buyback yield gives us the gross cash yield to use as our cash flow in the numerator of the discount model. This gross cash yield is increased each year over the next five years by the growth rate. These cash flows must be discounted to determine their present value. The discount rate in each denominator is the risk-free rate (R_F) plus the discount rate (K). The following formula shows how the implied return is calculated. Since the current value of the S&P is known, we can solve for K: the implied market return.[72]

[72] *See* Exhibit DJG-9 for detailed calculation.

Equation 5:
Implied Market Return

$$V_{500} = \frac{CY_1(1+g)^1}{(1+R_F+K)^1} + \frac{CY_2(1+g)^2}{(1+R_F+K)^2} + \cdots + \frac{CY_5(1+g)^5 + TV}{(1+R_F+K)^5}$$

where:
- V_{500} = *current value of index (S&P 500)*
- $CY_{1\text{-}5}$ = *average cash yield over last five years (includes dividends and buybacks)*
- g = *compound growth rate in earnings over last five years*
- R_F = *risk-free rate*
- K = *implied market return (this is what we are solving for)*
- TV = *terminal value* $= CY_5 (1+R_F) / K$

The discount rate is called the "implied" return here because it is based on the current value of the index as well as the value of free cash flow to investors projected over the next five years. Thus, based on these inputs, the market is "implying" the expected return; or in other words, based on the current value of all stocks (the index price), and the projected value of future cash flows, the market is telling us the return expected by investors for investing in the market portfolio. After solving for the implied market return (K), I simply subtract the risk-free rate from it to arrive at the implied ERP.

Equation 6:
Implied Equity Risk Premium

$$Implied\ Expected\ Market\ Return - R_F = Implied\ ERP$$

Q. DISCUSS THE RESULTS OF YOUR IMPLIED ERP CALCULATION.

A. After collecting data for the index value, operating earnings, dividends, and buybacks for the S&P 500 over the past six years, I calculated the dividend yield, buyback yield, and gross cash yield for each year. I also calculated the compound annual growth rate (g) from operating earnings. I used these inputs, along with the risk-free rate and current value of the index to calculate a current expected return on the entire market of

7.5%. I subtracted the risk-free rate to arrive at the implied equity risk premium of 5.0%.[73] Dr. Damodaran, one of the world's leading experts on the ERP, promotes the implied ERP method discussed above. He calculates monthly and annual implied ERPs with this method and publishes his results. Dr. Damodaran's highest ERP estimate for September 2021 using several implied ERP variations was 4.8%.[74]

Q. WHAT ARE THE RESULTS OF YOUR FINAL ERP ESTIMATE?

A. For the final ERP estimate I used in my CAPM analysis, I considered the results of the ERP surveys along with the implied ERP calculations and the ERP reported by Duff & Phelps.[75] The results are presented in the following figure:

Figure 8:
Equity Risk Premium Results

IESE Business School Survey	5.6%
Duff & Phelps Report	5.5%
Damodaran (average)	4.8%
Garrett	5.0%
Average	**5.2%**
Highest	**5.6%**

[73] Exhibit DJG-9.

[74] Aswath Damodaran, *Implied Equity Risk Premium Update*, DAMODARAN ONLINE (last visited Nov. 2, 2020) http://pages.stern nyu.edu/~adamodar/.

[75] Exhibit DJG-10; see also Duff & Phelps, *Valuation Insights*, First Quarter 2021.

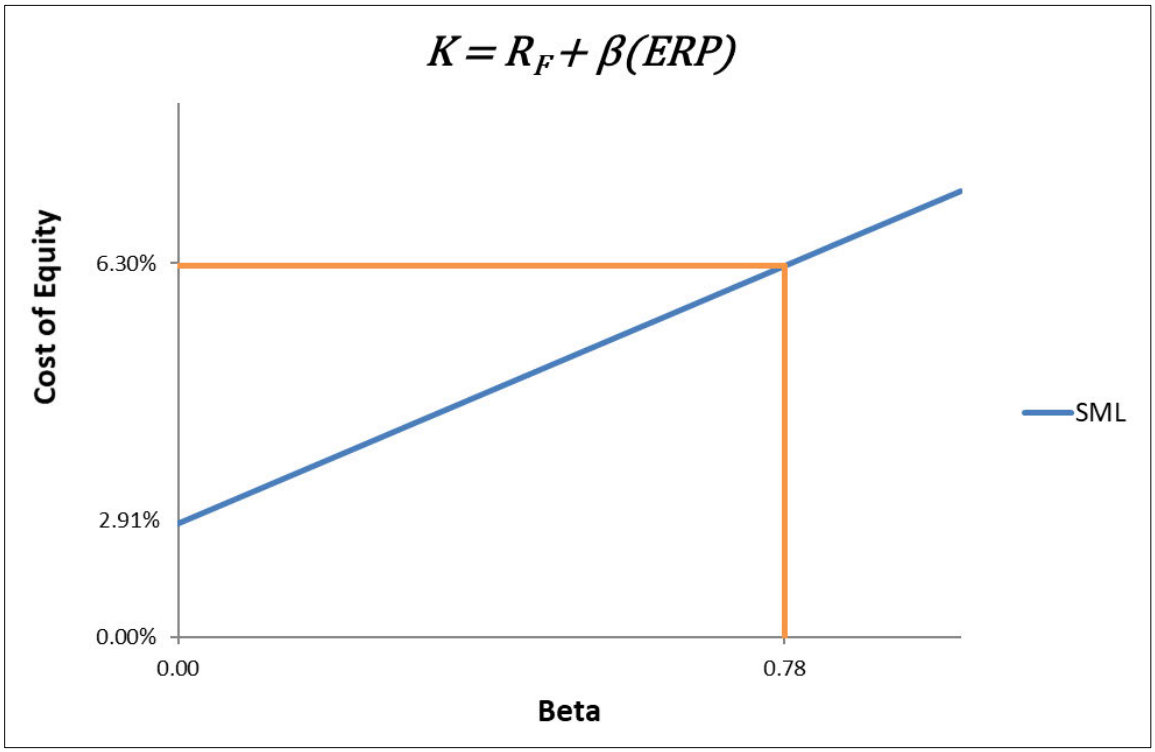
While it would be arguably reasonable to select any one of these ERP estimates to use in the CAPM, to be conservative, I selected the highest ERP estimate of 5.6% to use in my CAPM analysis. All else held constant, a higher ERP used in the CAPM will result in a higher cost of equity estimate.

Q. PLEASE EXPLAIN THE FINAL RESULTS OF YOUR CAPM ANALYSIS.

A. Using the inputs for the risk-free rate, beta coefficient, and ERP discussed above, I estimate that PWR's CAPM cost of equity is 6.3%.[76] The CAPM may be displayed graphically through what is known as the Security Market Line ("SML"). The following figure shows the expected return (cost of equity) on the y-axis, and the average beta for the proxy group on the x-axis. The SML intercepts the y-axis at the level of the risk-free rate. The slope of the SML is the equity risk premium.

[76] Exhibit DJG-11.

Figure 9:
CAPM Graph



The SML provides the rate of return that will compensate investors for the beta risk of that investment. Thus, at an average beta of 0.78 for the proxy group, the estimated CAPM cost of equity for PWR is 6.3%.

D. Response to Witness Moul's CAPM Analysis

Q. WITNESS MOUL'S CAPM ANALYSIS YIELDS NOTABLY HIGHER RESULTS. DID YOU FIND SPECIFIC PROBLEMS WITH WITNESS MOUL'S CAPM ASSUMPTIONS AND INPUTS?

A. Yes, I did. Witness Moul's base CAPM cost of equity result is 10.5%, which is considerably higher than my estimate. There are two primary problems with witness Moul's CAPM: (1) his equity risk premium is notably higher than those reported by

thousands of experts and other objective analysts and scholars around the country; and (2) he adds a size premium adjustment that is inappropriate. I discuss each of these issues below.

1. Equity Risk Premium

Q. DID WITNESS MOUL RELY ON A REASONABLE MEASURE FOR THE ERP?

A. No, he did not. Witness Moul used an input of 9.0 for the ERP, which is not realistic.[77] The ERP is one of three inputs in the CAPM equation, and it is one of the most important factors for estimating the cost of equity in this case. As discussed above, I used three widely accepted methods for estimating the ERP, including consulting expert surveys, calculating the implied ERP based on aggregate market data, and considering the ERPs published by reputable analysts. The highest ERP found from my research and analysis is only 5.6%.

Q. PLEASE DISCUSS AND ILLUSTRATE HOW WITNESS MOUL'S ERP COMPARES WITH OTHER ESTIMATES FOR THE ERP.

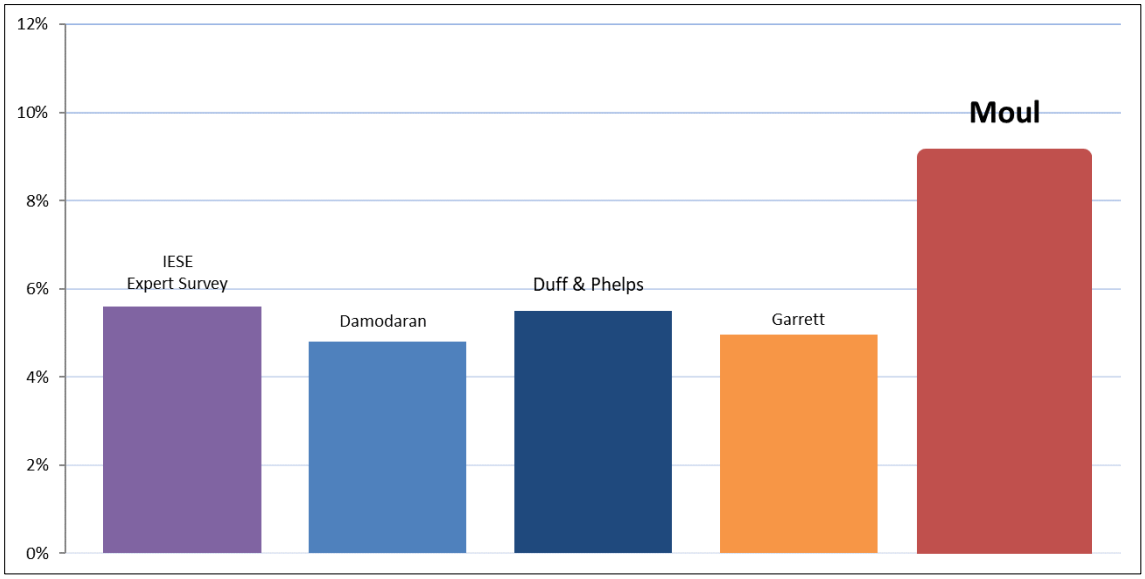
A. The 2020 IESE Business School expert survey reports an average ERP of 5.6%. Similarly, Duff & Phelps recently estimated an ERP of 5.5%. Dr. Damodaran, one of the leading experts on the ERP, recently estimated an ERP of only 4.8%.[78] The chart in the

[77] Direct Testimony of Paul R. Moul, p. 35, line 9.

[78] Aswath Damodaran, *Implied Equity Risk Premium Update*, DAMODARAN ONLINE, http://pages.stern nyu.edu/~adamodar/. Dr. Damodaran estimates several ERPs using various assumptions.

following figure illustrates that witness Moul's ERP estimate is far out of line with other reasonable, objective estimates for the ERP.[79]

Figure 10:
Equity Risk Premium Comparison



When compared with other independent sources for the ERP, as well as my estimate, witness Moul's ERP estimate is clearly not within the range of reasonableness. As a result, his CAPM cost of equity estimate is overstated.

2. <u>Size Premium</u>

Q. DESCRIBE WITNESS MOUL'S SIZE PREMIUM ADJUSTMENT TO HIS CAPM.

A. Witness Moul adds 1.02% to his CAPM on the basis that PWR is smaller than the proxy group.[80]

[79] *See* Exhibit DJG-10. The ERP estimated by Dr. Damodaran is the average of several ERP estimates under slightly differing assumptions.

[80] Direct Testimony of Paul R. Moul, pp. 35-36.

Q. DO YOU AGREE WITH WITNESS MOUL'S SIZE PREMIUM?

A. No. The "size effect" phenomenon arose from a 1981 study conducted by Banz, which found that "in the 1936 – 1975 period, the common stock of small firms had, on average, higher risk-adjusted returns than the common stock of large firms."[81] According to Ibbotson, Banz's size effect study was "[o]ne of the most remarkable discoveries of modern finance."[82] Perhaps there was some merit to this idea at the time, but the size effect phenomenon was short lived. Banz's 1981 publication generated much interest in the size effect and spurred the launch of significant new small cap investment funds. However, this "honeymoon period lasted for approximately two years. . . ." [83] After 1983, U.S. small-cap stocks actually underperformed relative to large cap stocks. In other words, the size effect essentially reversed. In *Triumph of the Optimists*, the authors conducted an extensive empirical study of the size effect phenomenon around the world. They found that after the size effect phenomenon was discovered in 1981, it disappeared within a few years:

[81] Rolf W. Banz, *The Relationship Between Return and Market Value of Common Stocks* 3-18 (Journal of Financial Economics 9 (1981)).

[82] 2015 Ibbotson Stocks, Bonds, Bills, and Inflation Classic Yearbook 99 (Morningstar 2015).

[83] Elroy Dimson, Paul Marsh & Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* 131 (Princeton University Press 2002).

> It is clear . . . that there was a global reversal of the size effect in virtually every country, with the size premium not just disappearing but going into reverse. Researchers around the world universally fell victim to Murphy's Law, with the very effect they were documenting – and inventing explanations for – promptly reversing itself shortly after their studies were published.[84]

In other words, the authors assert that the very discovery of the size effect phenomenon likely caused its own demise. The authors ultimately concluded that it is "inappropriate to use the term 'size effect' to imply that we should automatically expect there to be a small-cap premium," yet, this is exactly what utility witnesses often do in attempting to artificially inflate the cost of equity with a size premium. Other prominent sources have agreed that the size premium is a dead phenomenon. According to Ibbotson:

> The unpredictability of small-cap returns has given rise to another argument against the existence of a size premium: that markets have changed so that the size premium no longer exists. As evidence, one might observe the last 20 years of market data to see that the performance of large-cap stocks was basically equal to that of small cap stocks. In fact, large-cap stocks have outperformed small-cap stocks in five of the last 10 years.[85]

In addition to the studies discussed above, other scholars have concluded similar results. According to Kalesnik and Beck:

[84] *Id*. at 133.

[85] 2015 Ibbotson Stocks, Bonds, Bills, and Inflation Classic Yearbook 112 (Morningstar 2015).

> Today, more than 30 years after the initial publication of Banz's paper, the empirical evidence is extremely weak even before adjusting for possible biases. . . . The U.S. long-term size premium is driven by the extreme outliers, which occurred three-quarters of a century ago. . . . Finally, adjusting for biases . . . makes the size premium vanish. If the size premium were discovered today, rather than in the 1980s, it would be challenging to even publish a paper documenting that small stocks outperform large ones.[86]

For all of these reasons, the Commission should reject the arbitrary size premium proposed by the Company.

VIII. OTHER COST OF EQUITY ISSUES

Q. ARE THERE ANY OTHER ISSUES RAISED IN WITNESS MOUL'S TESTIMONY TO WHICH YOU WOULD LIKE TO RESPOND?

A. Yes. Witness Moul conducts his own risk premium model that overstates the cost of equity. In addition, he conducts a comparable earnings model that that overstates the cost of equity. I will discuss these two issues below.

A. Risk Premium Model

Q. PLEASE DESCRIBE WITNESS MOUL'S RISK PREMIUM MODEL.

A. Witness Moul conducts what he calls a "risk premium analysis," which purportedly estimates a risk premium for public utilities by adding an equity risk premium to the prospective yield for long-term utility debt.[87]

[86] Vitali Kalesnik and Noah Beck, *Busting the Myth About Size* (Research Affiliates 2014), available at https://www.researchaffiliates.com/Our%20Ideas/Insights/Fundamentals/Pages/284_Busting_the_Myth_About_Size.aspx (emphasis added).

[87] Direct Testimony of Paul R. Moul, pp. 28-32.

Q. DO YOU AGREE WITH THE RESULTS OF WITNESS MOUL'S RISK PREMIUM MODEL?

A. No. Not only do I disagree with the results, but I also disagree with the entire premise of the model. First, his risk premium model produced a result of 10.5%, which is more than 300 basis points higher than a reasonable cost of equity estimate for PWR.[88] Furthermore, the risk premium analysis offered by witness Moul is completely unnecessary when we already have a real risk premium model to use: the CAPM. The CAPM itself is a "risk premium" model; it takes the bare minimum return any investor would require for buying a stock (the risk-free rate), then adds a premium to compensate the investor for the extra risk he or she assumes by buying a stock rather than a riskless U.S. Treasury security. The CAPM has been utilized by companies around the world for decades for the same purpose we are using it in this case – to estimate cost of equity.

In stark contrast to the Nobel-prize-winning CAPM, which is found in almost every comprehensive financial textbook, the risk premium model offered by witness Moul might be found in the testimonies of some other utility ROE witnesses. Unsurprisingly, these distorted risk premium models inevitably produce results that are significantly higher than anything that could be considered reasonable for a real cost of equity estimate.

If we removed the betas term from the CAPM, we would add the risk-free rate to the equity risk premium in order to arrive at a reasonable estimate for the cost of equity of the U.S. equity market. In this case, the risk-free rate is about 2%, and the equity risk

[88] *Id*. at p. 32.

premium is about 5.5%. Adding these two numbers together indicates a cost of equity for the U.S. market of about 7.5%. Thus, the cost of equity for any security with a beta of less than one (including the utility proxy group), must be less than 7.5%. It is not surprising then, that my analysis indicates a cost of equity of 7.1% for PWR.

In contrast, witness Moul's risk premium analysis apparently uses 3.75% as a quasi-risk-free rate, and then uses 6.75% as an equity risk premium (adding these two numbers equals 10.5%). Both of these important inputs are clearly overstated, and consequently, the results of witness Moul's risk premium analyses are overstated.

B. Comparable Earnings Model

Q. PLEASE SUMMARIZE WITNESS MOUL'S COMPARABLE EARNINGS APPROACH.

A. Witness Moul also analyzed the returns realized by non-regulated companies as an indication of PWR's cost of equity.[89] The results of his comparable earnings approach produce a result of 12.8%.[90]

Q. DO YOU AGREE WITH WITNESS MOUL'S ANALYSES?

A. No. A result of 12.8% is more than 500 basis points higher than a reasonable cost of equity estimate for PWR. There are two notable problems with witness Moul's comparable earnings approach: (1) earned returns do not indicate the cost of equity; and (2) there is no marginal value in analyzing competitive firms beyond those of the utility

[89] Direct Testimony of Paul R. Moul, pp. 45-48.

[90] *Id*. at p. 48, lines 8-9.

proxy group in terms of assessing a comparable risk profile. First, the earned return of any company should have a meaningful effect on its cost of equity. Conceptually, "earned" returns and "expected" returns are different from each other. For example, we might conduct a cost of equity analysis on Walmart's stock and determine that, based on the risk inherent in that investment, we should "expect" a 10% return on our investment (i.e., the cost of equity from Walmart's perspective). Suppose that Walmart, however, has a bad year and only "earned" a 5% ROE. This does not mean that going forward we will now "expect" a return of only 5% on our equity investment in Walmart. Likewise, the same would be true if Walmart had a good year and earned a 20% return. In finance, the "expected" return on equity as investor (which is synonymous with the "cost" of equity from the company's perspective) is simply based on the risk inherent in that investment, and is not directly influenced by the company's actual, earned return for any given period of time. Thus, witness Moul's analysis of earned returns does not add any value for assessing the cost of equity for PWR beyond the results of the CAPM and DCF Model.

The second problem with witness Moul's comparable earnings approach is that it uses the earned returns of non-regulated, non-utility companies as an indication of PWR's cost of equity. Despite the title of witness Moul's model, competitive, non-utility companies are decisively *incomparable* to PWR. Primarily, the risk profiles of competitive firms will tend to be higher than those of low-risk utilities; thus, their cost of equity estimates will generally be higher. Not surprisingly, the results of witness Moul's "comparable" earnings approach are higher than those produced by the models he conducted on the utility proxy group. For example, the projected earned returns for witness

Moul's non-utility comparable earnings group are as high as 38%.[91] In fact, the projected returns for the vast majority of witness Moul's selected non-utility group are significantly higher than any reasonable cost of equity estimate for PWR. There is simply no marginal value added to the process of estimating utility cost of equity by using non-utility, non-regulated firms in a proxy group that should contain firms with relatively similar risk profiles to the regulated utility being analyzed. Moreover, the results of witness Moul's comparable earnings approach is *more than 500 basis points* above a reasonable estimate for PWR's market-based cost of equity.

IX. CAPITAL STRUCTURE AND COST OF DEBT

Q. PLEASE DESCRIBE IN GENERAL THE CONCEPT OF A COMPANY'S CAPITAL STRUCTURE.

A. "Capital structure" refers to the way a company finances its overall operations through external financing. The primary sources of long-term, external financing are debt capital and equity capital. Debt capital usually comes in the form of contractual bond issues that require the firm to make payments, while equity capital represents an ownership interest in the form of stock. Because a firm cannot pay dividends on common stock until it satisfies its debt obligations to bondholders, stockholders are referred to as "residual claimants." The fact that stockholders have a lower priority to claims on company assets increases their risk and the required return relative to bondholders. Thus, equity capital has a higher cost than debt capital. Firms can reduce their WACC by recapitalizing and

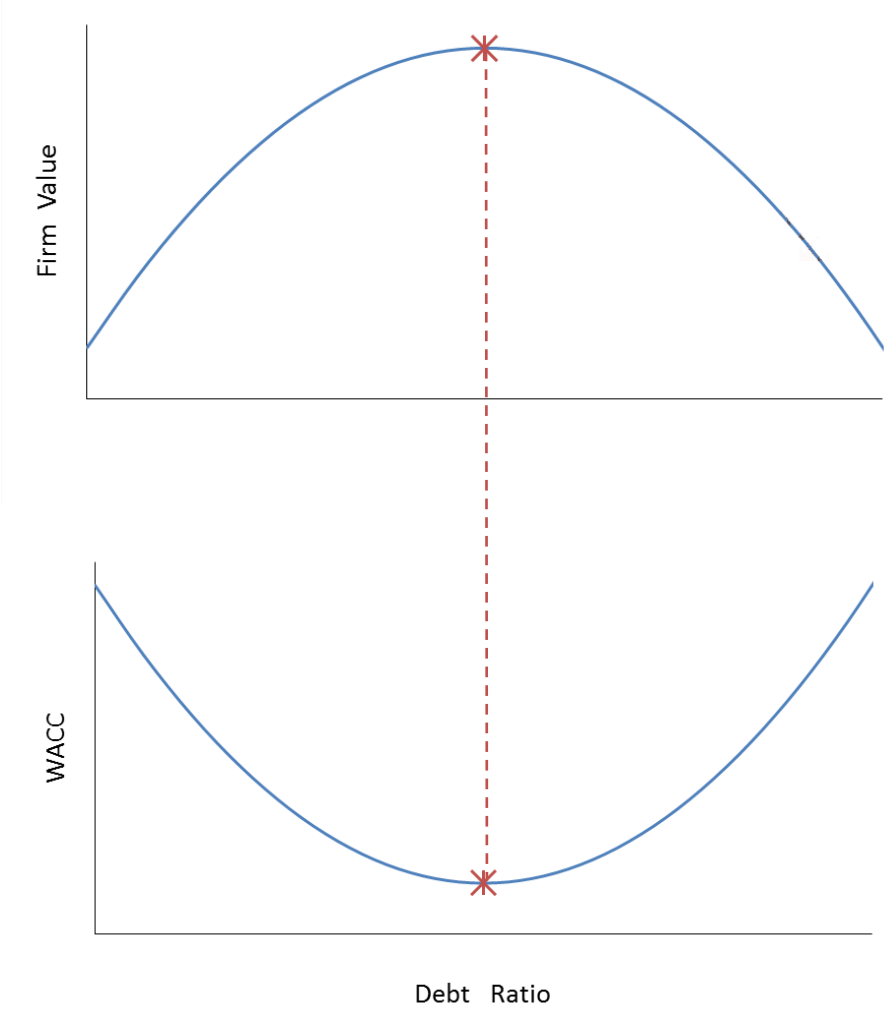
[91] Exhibit PRM-1, Sch. 14.

increasing their debt financing. In addition, because interest expense is deductible, increasing debt also adds value to the firm by reducing the firm's tax obligation.

Q. IS IT TRUE THAT, BY INCREASING DEBT, COMPETITIVE FIRMS CAN ADD VALUE AND REDUCE THEIR WACC?

A. Yes, it is. A competitive firm can add value by increasing debt. After a certain point, however, the marginal cost of additional debt outweighs its marginal benefit. This is because the more debt the firm uses, the higher interest expense it must pay, and the likelihood of loss increases. This also increases the risk of non-recovery for both bondholders and shareholders, causing both groups of investors to demand a greater return on their investment. Thus, if debt financing is too high, the firm's WACC will increase instead of decrease. The following figure illustrates these concepts.

Figure 11:
Optimal Debt Ratio



As shown in this figure, a competitive firm's value is maximized when the WACC is minimized. In both graphs, the debt ratio is shown on the x-axis. By increasing its debt ratio, a competitive firm can minimize its WACC and maximize its value. At a certain point, however, the benefits of increasing debt do not outweigh the costs of the additional

risks to both bondholders and shareholders, as each type of investor will demand higher returns for the additional risk they have assumed.[92]

Q. DOES THE RATE BASE RATE OF RETURN MODEL EFFECTIVELY INCENTIVIZE UTILITIES TO OPERATE AT THE OPTIMAL CAPITAL STRUCTURE?

A. No. While it is true that competitive firms maximize their value by minimizing their WACC, this is not the case for regulated utilities. Under the rate base rate of return model, a higher WACC results in higher rates, all else held constant. The basic revenue requirement equation is as follows:

Equation 7:
Revenue Requirement for Regulated Utilities

$$RR = O + d + T + \boldsymbol{r}(A - D)$$

where:

RR	=	*revenue requirement*
O	=	*operating expenses*
d	=	*depreciation expense*
T	=	*corporate tax*
$\boldsymbol{r}$	=	***weighted average cost of capital (WACC)***
A	=	*plant investments*
D	=	*accumulated depreciation*

As shown in this equation, utilities can increase their revenue requirement by increasing their WACC, not by minimizing it. Thus, because there is no incentive for a regulated utility to minimize its WACC, a commission standing in the place of competition must ensure that the regulated utility is operating at the lowest reasonable WACC.

[92] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 440-41 (3rd ed., South Western Cengage Learning 2010).

Q. CAN UTILITIES GENERALLY AFFORD TO HAVE HIGHER DEBT LEVELS THAN OTHER INDUSTRIES?

A. Yes. Because regulated utilities have large amounts of fixed assets, stable earnings, and low risk relative to other industries, they can afford to have relatively higher debt ratios (or "leverage"). As aptly stated by Dr. Damodaran:

> Since financial leverage multiplies the underlying business risk, it stands to reason that firms that have high business risk should be reluctant to take on financial leverage. It also stands to reason that firms that operate in stable businesses should be much more willing to take on financial leverage. Utilities, for instance, have historically had high debt ratios but have not had high betas, mostly because their underlying businesses have been stable and fairly predictable.[93]

Note that the author explicitly contrasts utilities with firms that have high underlying business risk. Because utilities have low levels of risk and operate a stable business, they should generally operate with relatively high levels of debt to achieve their optimal capital structure.

Q. DESCRIBE THE APPROACHES YOU USED TO ASSESS THE REASONABLENESS OF PWR'S CAPITAL STRUCTURE FOR RATEMAKING PURPOSES?

A. To assess a reasonable capital structure for PWR, I examined the capital structures of the proxy group and PWR's parent company, SWWC. I also compared PWR's proposed debt ratio with debt ratios observed in other industries. I discuss each of these approaches in more detail below.

[93] Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 196 (3rd ed., John Wiley & Sons, Inc. 2012).

A. Proxy and Parent Utility Debt Ratios

Q. PLEASE DESCRIBE THE DEBT RATIOS OF THE PROXY GROUP.

A. According to the debt ratios recently reported in Value Line for the utility proxy group (the same proxy group used by witness Moul), the average debt ratio of the proxy group in 2020 was 50%.[94] This is notably higher than PWR's proposed debt ratio of only 40%.

Q. WHAT IS SWWC'S DEBT RATIO?

A. PWR's parent company, SWWC, reported a debt ratio of [redacted] at the end of [redacted].[95] This figure provides a strong indication of a fair debt ratio for PWR for ratemaking purposes because SWWC is the closest unregulated proxy to PWR.

B. Competitive Industry Debt Ratios

Q. PLEASE DESCRIBE THE DEBT RATIOS RECENTLY OBSERVED IN COMPETITIVE U.S. INDUSTRIES.

A. There are currently more than 3,000 firms in U.S. industries with higher debt ratios than 50% (my proposed ratemaking debt ratio for PWR), with an average debt ratio of about 64%.[96] The following figure shows a sample of these industries with debt ratios higher than 56%.

[94] Exhibit DJG-14.

[95] *See* [redacted]

[96] Exhibit DJG-15.

Figure 12:
Competitive Industry with Debt Ratio Sample

Industry	# Firms	Debt Ratio
Financial Svcs. (Non-bank & Insurance)	235	95%
Retail (Building Supply)	15	88%
Hospitals/Healthcare Facilities	32	84%
Air Transport	17	84%
Advertising	61	81%
Hotel/Gaming	66	77%
Brokerage & Investment Banking	39	77%
Auto & Truck	19	75%
Retail (Automotive)	30	74%
Food Wholesalers	18	74%
Retail (Special Lines)	85	72%
Recreation	69	71%
Bank (Money Center)	7	68%
Retail (Grocery and Food)	14	68%
Transportation	21	68%
Computers/Peripherals	52	68%
Packaging & Container	26	67%
Broadcasting	29	65%
Rubber& Tires	3	64%
Beverage (Soft)	41	64%
Chemical (Basic)	48	62%
Oil/Gas Distribution	57	62%
Cable TV	13	**61%**
R.E.I.T.	238	61%
Apparel	51	61%
Trucking	35	61%
Computer Services	116	61%
Retail (Distributors)	85	60%
Telecom (Wireless)	16	**60%**
Power	55	**60%**
Farming/Agriculture	32	59%
Business & Consumer Services	169	59%
Aerospace/Defense	72	59%
Telecom. Services	58	59%
Retail (Online)	75	58%
Utility (General)	16	**58%**
Software (Internet)	36	57%
Household Products	140	57%
Construction Supplies	46	57%
Total / Average	**2,237**	**67%**

Many of the industries shown here, like public utilities, are generally well-established industries with large amounts of capital assets. The shareholders of these industries generally prefer these higher debt ratios in order to maximize their profits. There are several notable industries that are relatively comparable to public utilities. For example, the Cable TV, Telecom, Power, and General Utility industries all have an average debt ratios close to 60%.

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR CAPITAL STRUCTURE ANALYSES.

A. As described above, I analyzed PWR's proposed debt ratio under several approaches. The results of my analyses are summarized in the following table:

Figure 13:
Capital Structure Analysis – Summary of Results

Source	Debt Ratio
Cable TV	61%
Telecom (Wireless)	60%
Power	60%
Utility (General)	58%
SouthWest Water Company	[redacted]
Proxy Group of Utilities	50%
Garrett Proposal	50%
Company's Proposal	40%

As shown in this figure, PWR's proposed debt ratio is clearly too low. This results in excessively high capital costs and utility rates. My analysis indicates that PWR's debt ratio for ratemaking should be at least 50%. Thus, I recommend the Commission adopt a capital structure for PWR consisting of 50% debt and 50% equity.

Q. ARE YOU RECOMMENDING AN ADJUSTMENT TO PWR'S PROPOSED COST OF DEBT?

A. No. PWR proposes a cost of debt of 3.79%.[97] I used the same cost of debt in calculating my proposed rate of return.[98]

X. RING-FENCING PROVISIONS

Q. PLEASE DESCRIBE THE RECENT ACQUISITION OF PWR.

A. On September 14, 2020, SWWC announced that its wholly-owned subsidiary, SCUS, acquired Ni South Carolina, LLC (now Ni South Carolina, Inc.), the parent company of PWR, from Ni Pacolet Milliken Utilities, LLC. ("Ni Pacolet") (the "Acquisition").

Q. WHAT ACQUISITION COMPONENTS DID YOU CONSIDER AS PART OF YOUR REVIEW?

A. Broadly, my review of the acquisition focused on capital-related items such as the capital structure and cost of debt, acquisition costs, goodwill, and customer protection

[97] *See* Exhibit PRM-1, Sch. 1.

[98] *See* Exhibit DJG-16.

mechanisms, such as ring-fencing provisions, that are commonly included in mergers and acquisitions.

Q. WHAT POST-ACQUISITION CHANGES TO CAPITAL-RELATED ITEMS DID YOU NOTE AS PART OF YOUR REVIEW?

A. Since the Company's last rate case, PWR's cost of debt has decreased 144 basis points from 5.23% in 2018 to the estimated 3.79% in this proceeding.[99] This reduction in debt costs is a benefit to customers following the Acquisition.

Q. PLEASE DESCRIBE YOUR REVIEW AND RECOMMENDATIONS OF THE COMPANY'S ACQUISITION COSTS.

A. Acquisition costs refer to any costs incurred in connection with the completion of the acquisition. In response to ORS discovery requests, the Company stated that costs related to the Acquisition were neither incurred by nor pushed down to any South Carolina subsidiary and that the costs had not been included as part of the Company's current Application.[100] These costs should not be borne by ratepayers in this or any other rate proceeding. Therefore, while the Company has not sought recovery in this proceeding, I recommend that the Commission bar recovery of these costs in any future rate proceeding.

Q. WHAT COMMITMENTS HAS THE COMPANY MADE WITH RESPECT TO GOODWILL?

A. Goodwill refers to an intangible asset that represents the value placed on a company above its fair market value in a merger or acquisition. The Company stated that PWR has

[99] *See* Commission Docket No. 2018-82-S.

[100] PWR Response to ORS Information Request 10-1(c).

no goodwill recorded on its regulatory books related to the 2020 acquisition and "commits to not request recovery of any related goodwill in any future rate case."[101] As with acquisition costs, the cost of goodwill should not be borne by ratepayers. Therefore, in addition to the other commitments I discuss below, I recommend the Commission bar recovery of any goodwill related to this Acquisition in any future rate proceeding.

Q. WHAT ADDITIONAL CUSTOMER PROTECTION MECHANISMS DID YOU INCLUDE IN YOUR REVIEW?

A. Customer protections are a crucial component of mergers and acquisitions involving a regulated utility. Without clearly defined parameters, utility customers can become liable for corporate decisions from which they do not directly benefit. I reviewed standard protocols that are frequently used to insulate customers, including whether: (1) PWR would be the guarantor of debt for SWWC or any SWWC affiliate or subsidiary; (2) any debt PWR incurs would be used only for purposes specific to the PWR system; (3) PWR is in a position to lend cash or other capital to SWWC or any SWWC affiliate or subsidiary now or in the future; and (4) any other provisions that have been implemented to protect PWR's customers following the acquisition.

Q. PLEASE DISCUSS YOUR REVIEW AND CONCLUSIONS RELATED TO THESE CUSTOMER PROTECTIONS.

A. ORS asked the Company for confirmation that neither SWWC nor any SWWC affiliate or subsidiary is using or would seek to use PWR as a guarantor for any debt for

[101] PWR Response to DCA Information Request 2-9(g) and 2-9(h).

SWWC or any of its affiliates or subsidiary entities. In response, the Company stated that PWR was not currently being used as a guarantor of any such debt, and that, "[s]hould SWWC or any of its affiliates or subsidiaries seek to use PWR as a guarantor of debt in the future, it would seek approval to do so from the . . . Commission."[102] It is imperative that PWR should never be a guarantor of debt for SWWC or any of its affiliates or subsidiaries as this could subject PWR customers to liabilities for which they are receiving no benefit.

With respect to debt incurred by PWR directly, ORS asked the Company for confirmation that any debt incurred by PWR is and would only be used for purposes specific to the PWR system. In response, the Company stated that PWR does not currently have any issued debt and that, should it "seek to issue debt in the future for purposes not specific to the PWR system it would seek approval to do so from the . . . Commission."[103] As with the potential for PWR to be a guarantor of debt for its parent, its parent's subsidiaries, or any affiliates, PWR customers should be insulated from concerns stemming from PWR taking on debt that is not directly and solely benefiting the PWR system.

ORS also asked the Company to confirm that PWR does not and will not lend cash or any other capital directly to SWWC or any of its affiliate or subsidiary entities except for purposes of routine and prudent cash management practices. In response, the Company stated that it is not currently doing so, and that it would seek approval from the Commission if it were to seek to do so in the future. This is yet another customer service protection provision that should be implemented to insulate PWR customers.

[102] PWR Response to ORS Information Request 14-1.

[103] PWR Response to ORS Information Request 14-2.

Q. TO YOUR KNOWLEDGE, HAS SWWC, ANY SWWC SUBSIDIARY, PWR, OR ANY OF PWR'S NEW AFFILIATES COMMITTED TO ANY ADDITIONAL FINANCIAL OR OTHER PROTECTIONS TO PWR CUSTOMERS KNOWN AS RING-FENCING PROVISIONS?

A. No. I am not aware of any additional protective commitments made to PWR's customers in connection with the Acquisition. Further, in response to an ORS Discovery Request, the Company stated that it did not have any additional mechanisms, covenants, restrictions, or any other enumerated provisions designed to provide protections for PWR customers in light of the Acquisition beyond the confirmations PWR provided in response to ORS Information Requests 14-1, 14-2, and 14-3 and information provided in response to other prior discovery requests.[104]

Q. DESCRIBE WHAT IS MEANT BY "RING-FENCING"?

A. The term "ring-fencing" generally refers to a number of protections designed to financially insulate a regulated public utility from its unregulated subsidiaries such that additional and undue risks are not imposed on the customers of the regulated entity.

Q. ARE RING-FENCING PROVISIONS COMMON IN THE UTILITY INDUSTRY?

A. Yes, to my knowledge. It is also my understanding that ring-fencing provisions agreed to on the part of the acquiring utility are not uncommon as a condition of a potential merger or acquisition. For example, in November 2020, Texas-New Mexico Power Company, NM Green Holdings, Inc., and Avangrid filed an application before the Public

[104] PWR Response to ORS Information Request 14-4.

Utility Commission of Texas for approval of a merger. In that proceeding, the utility-applicants proposed a standard list of ring-fencing protections. The applicants and other intervening parties in that proceeding reached a settlement that included a standard set of ring-fencing protections.[105] Recently, the Commission approved the acquisition of CUC, Inc. ("CUC") by South Carolina Water Utilities, Inc. – CUC, Inc. ("SCWU-CUC") after the parties, including ORS, reached a Settlement Agreement.[106] This Agreement included customer protection provisions related to acquisition and transaction costs, goodwill, and financial protections so that SCWU-CUC would not assume or be liable for debt not directly benefiting the SCWU-CUC system.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS FOLLOWING THE ACQUISITION OF PWR.

A. The Acquisition through which PWR became a subsidiary of SWWC did not require Commission approval. As such, this proceeding is the first opportunity for the Commission to review and implement ratepayer protections for PWR customers subsequent to the Acquisition. Following is a summary of my recommendations resulting from my review. Additionally, ORS witness Hunnell discusses operational changes following the acquisition in his Direct Testimony.

My review of the customer protections previously mentioned in my testimony indicates that the Company:

[105] *See* PUC Docket No. 51547 before the Public Utility Commission of Texas, Unanimous Stipulation and Agreement.

[106] *See* Commission Order No. 2021-93 in Docket No. 2020-225-WS.

- Is committed to not request recovery of any goodwill associated with this acquisition in this or any future rate proceeding;[107]
- Did not seek to recover any acquisition or transaction costs associated with this acquisition in the current rate proceeding;[108]
- Is not currently a guarantor of any debt for SWWC or any SWWC affiliate or subsidiary and committed to seeking Commission approval should these entities seek to use PWR as the guarantor for debt in the future;[109]
- Does not currently have any issued debt and committed to seeking Commission approval should PWR seek to issue any future debt when not used solely for purposes specific to the PWR system;[110]
- Does not currently lend cash or any other capital directly to SWWC or any SWWC affiliate or subsidiary except for routine and prudent cash management practices and committed to seeking Commission approval should PWR seek to lend cash or any other capital directly to SWWC or any of its affiliate or subsidiary entities except for routine and prudent cash management purposes;[111] and

[107] PWR Response to DCA Information Request 2-9(g) and 2-9(h).

[108] PWR Response to ORS Information Request 10-1(c).

[109] PWR Response to ORS Information Request 14-1.

[110] PWR Response to ORS Information Request 14-2.

[111] PWR Response to ORS Information Request 14-3.

- Has no additional mechanisms, covenants, restrictions, or any other enumerated provisions in place that are designed to provide protections to PWR's customers following the Acquisition other than those previously disclosed.[112]

Therefore, I recommend that the Commission adopt as part of its Order that:

- PWR will not seek recovery of any goodwill associated with this acquisition in any future rate proceedings;
- PWR will not seek to recover any acquisition or transaction costs associated with this acquisition in any future rate proceedings;
- PWR will not in any way be the guarantor of any debt for SWWC or any SWWC affiliate or subsidiary entities unless the debt is incurred for purposes specific to the PWR system and operations;
- Any debt incurred by PWR is and will only be used for purposes specific to the PWR system; and
- PWR will not lend cash or any other capital directly to SWWC or any SWWC affiliate or subsidiary entities except for routine and prudent cash management practices.

Q. WILL YOU UPDATE YOUR DIRECT TESTIMONY BASED ON INFORMATION THAT BECOMES AVAILABLE?

[112] PWR Response to ORS Information Request 14-4.

A. Yes. ORS fully reserves the right to revise its recommendations via supplemental testimony should new information not previously provided by the Company, or other sources, become available.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

APPENDIX A:

DISCOUNTED CASH FLOW MODEL THEORY

The Discounted Cash Flow ("DCF") Model is based on a fundamental financial model called the "dividend discount model," which maintains that the value of a security is equal to the present value of the future cash flows it generates. Cash flows from common stock are paid to investors in the form of dividends. There are several variations of the DCF Model. In its most general form, the DCF Model is expressed as follows:[113]

Equation 1:
General Discounted Cash Flow Model

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n}{(1+k)^n}$$

where: P_0 = *current stock price*
$D_1 \ldots D_n$ = *expected future dividends*
k = *discount rate / required return*

The General DCF Model would require an estimation of an infinite stream of dividends. Because this would be impractical, analysts use more feasible variations of the General DCF Model, which are discussed further below.

The DCF Models rely on the following four assumptions:[114]

1. Investors evaluate common stocks in the classical valuation framework; that is, they trade securities rationally at prices reflecting their perceptions of value;

2. Investors discount the expected cash flows at the same rate (K) in every future period;

[113] *See* Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 410 (9th ed., McGraw-Hill/Irwin 2013).

[114] *See* Roger A. Morin, *New Regulatory Finance* 252 (Public Utilities Reports, Inc. 2006) (1994).

3. The K obtained from the DCF equation corresponds to that specific stream of future cash flows alone; and

4. Dividends, rather than earnings, constitute the source of value.

The General DCF can be rearranged to make it more practical for estimating the cost of equity. Regulators typically rely on some variation of the Constant Growth DCF Model, which is expressed as follows:

Equation 2:
Constant Growth Discounted Cash Flow Model

$$K = \frac{D_1}{P_0} + g$$

where: K = *discount rate / required return on equity*
D_1 = *expected dividend per share one year from now*
P_0 = *current stock price*
g = *expected growth rate of future dividends*

Unlike the General DCF Model, the Constant Growth DCF Model solves for the required return (K) directly. In addition, by assuming that dividends grow at a constant rate, the dividend stream from the General DCF Model may be substituted with a term representing the expected constant growth rate of future dividends (g). The Constant Growth DCF Model may be considered in two parts. The first part is the dividend yield (D_1/P_0), and the second part is the growth rate (g). In other words, the required return in the DCF Model is equivalent to the dividend yield plus the growth rate.

In addition to the four assumptions listed above, the Constant Growth DCF Model relies on the following four additional assumptions:[115]

1. The discount rate (K) must exceed the growth rate (g);

[115] *See* Roger A. Morin, *New Regulatory Finance* 254–56 (Public Utilities Reports, Inc. 2006) (1994).

2. The dividend growth rate (g) is constant in every year to infinity;

3. Investors require the same return (K) in every year; and

4. There is no external financing; that is, growth is provided only by the retention of earnings.

Because the growth rate in this model is assumed to be constant, it is important not to use growth rates that are unreasonably high. In fact, the constant growth rate estimate for a regulated utility with a defined service territory should not exceed the growth rate for the economy in which it operates.

The basic form of the Constant Growth DCF Model described above is sometimes referred to as the "Annual" DCF Model. This is because the model assumes an annual dividend payment to be paid at the end of every year, as well as an increase in dividends once each year. In reality, however, most utilities pay dividends on a quarterly basis. The Constant Growth DCF equation may be modified to reflect the assumption that investors receive successive quarterly dividends and reinvest them throughout the year at the discount rate. This variation is called the Quarterly Approximation DCF Model.[116]

Equation 3:
Quarterly Approximation Discounted Cash Flow Model

$$K = \left[\frac{d_0(1+g)^{1/4}}{P_0} + (1+g)^{1/4}\right]^4 - 1$$

where: K = *discount rate / required return*
d_0 = *current quarterly dividend per share*
P_0 = *stock price*
g = *expected growth rate of future dividends*

[116] *See* Roger A. Morin, *New Regulatory Finance* 348 (Public Utilities Reports, Inc. 2006) (1994).

The Quarterly Approximation DCF Model assumes that dividends are paid quarterly, and that each dividend is constant for four consecutive quarters. All else held constant, this model results in the highest cost of equity estimate for the utility in comparison to other DCF Models because it accounts for the quarterly compounding of dividends. There are several other variations of the Constant Growth (or Annual) DCF Model, including a Semi-Annual DCF Model, which is used by the Federal Energy Regulatory Commission ("FERC"). These models, along with the Quarterly Approximation DCF Model, have been accepted in regulatory proceedings as useful tools for estimating the cost of equity.

APPENDIX B:

CAPITAL ASSET PRICING MODEL

The Capital Asset Pricing Model ("CAPM") is a market-based model founded on the principle that investors demand higher returns for incurring additional risk.[117] The CAPM estimates this required return. The CAPM relies on the following assumptions:

1. Investors are rational, risk-adverse, and strive to maximize profit and terminal wealth;
2. Investors make choices based on risk and return. Return is measured by the mean returns expected from a portfolio of assets; risk is measured by the variance of these portfolio returns;
3. Investors have homogenous expectations of risk and return;
4. Investors have identical time horizons;
5. Information is freely and simultaneously available to investors;
6. There is a risk-free asset, and investors can borrow and lend unlimited amounts at the risk-free rate;
7. There are no taxes, transaction costs, restrictions on selling short, or other market imperfections; and
8. Total asset quality is fixed, and all assets are marketable and divisible.[118]

While some of these assumptions may appear to be restrictive, they do not outweigh the inherent value of the model. The CAPM has been widely used by firms, analysts, and regulators for decades to estimate the cost of equity capital.

The basic CAPM equation is expressed as follows:

[117] William F. Sharpe, *A Simplified Model for Portfolio Analysis* 277-93 (Management Science IX 1963).

[118] *Id*.

Equation 4:
Capital Asset Pricing Model

$$K = R_F + \beta_i(R_M - R_F)$$

where: K = *required return*
R_F = *risk-free rate*
β = *beta coefficient of asset i*
R_M = *required return on the overall market*

There are essentially three terms within the CAPM equation that are required to calculate the required return (K): (1) the risk-free rate (R_F); (2) the beta coefficient (β); and (3) the equity risk premium ($R_M - R_F$), which is the required return on the overall market less the risk-free rate.

Raw Beta Calculations and Adjustments.

A stock's beta equals the covariance of the asset's returns with the returns on a market portfolio, divided by the portfolio's variance, as expressed in the following formula:[119]

Equation 5:
Beta

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$$

where: β_i = *beta of asset i*
σ_{im} = *covariance of asset i returns with market portfolio returns*
σ^2_m = *variance of market portfolio*

Betas that are published by various research firms are typically calculated through a regression analysis that considers the movements in price of an individual stock and movements in the price of the overall market portfolio. The betas produced by this regression analysis are considered "raw" betas. There is empirical evidence that raw betas should be adjusted to account

[119] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 180–81 (3rd ed., South Western Cengage Learning 2010).

for beta's natural tendency to revert to an underlying mean.[120] Some analysts use an adjustment method proposed by Blume, which adjusts raw betas toward the market mean of one.[121] While the Blume adjustment method is popular due to its simplicity, it is arguably arbitrary, and some would say not useful at all. According to Dr. Damodaran: "While we agree with the notion that betas move toward 1.0 over time, the [Blume adjustment] strikes us as arbitrary and not particularly useful."[122] The Blume adjustment method is especially arbitrary when applied to industries with consistently low betas, such as the utility industry. For industries with consistently low betas, it is better to employ an adjustment method that adjusts raw betas toward an industry average, rather than the market average. Vasicek proposed such a method, which is preferable to the Blume adjustment method because it allows raw betas to be adjusted toward an industry average, and also accounts for the statistical accuracy of the raw beta calculation.[123] In other words, "[t]he Vasicek adjustment seeks to overcome one weakness of the Blume model by not applying the same adjustment to every security; rather, a security-specific adjustment is made depending on the statistical quality of the regression."[124] The Vasicek beta adjustment equation is expressed as follows:

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[120] *See* Michael J. Gombola and Douglas R. Kahl, *Time-Series Processes of Utility Betas: Implications for Forecasting Systematic Risk* 84–92 (Financial Management Autumn 1990).

[121] See Marshall Blume, *On the Assessment of Risk*, Vol. 26, No. 1 The Journal of Finance 1 (1971).

[122] *See* Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 187 (3rd ed., John Wiley & Sons, Inc. 2012).

[123] Oldrich A. Vasicek, *A Note on Using Cross-Sectional Information in Bayesian Estimation of Security Betas* 1233–1239 (Journal of Finance, Vol. 28, No. 5, December 1973).

[124] 2012 Ibbotson Stocks, Bonds, Bills, and Inflation Valuation Yearbook 77–78 (Morningstar 2012).

Equation 6:
Vasicek Beta Adjustment

$$\beta_{i1} = \frac{\sigma^2_{\beta i0}}{\sigma^2_{\beta 0} + \sigma^2_{\beta_{i0}}}\beta_0 + \frac{\sigma^2_{\beta 0}}{\sigma^2_{\beta 0} + \sigma^2_{\beta_{i0}}}\beta_{i0}$$

where: β_{i1} = *Vasicek adjusted beta for security i*
β_{i0} = *historical beta for security i*
β_0 = *beta of industry or proxy group*
$\sigma^2_{\beta 0}$ = *variance of betas in the industry or proxy group*
$\sigma^2_{\beta i0}$ = *square of standard error of the historical beta for security i*

The Vasicek beta adjustment is an improvement on the Blume model because the Vasicek model does not apply the same adjustment to every security. A higher standard error produced by the regression analysis indicates a lower statistical significance of the beta estimate. Thus, a beta with a high standard error should receive a greater adjustment than a beta with a low standard error. As stated in Ibbotson:

> While the Vasicek formula looks intimidating, it is really quite simple. The adjusted beta for a company is a weighted average of the company's historical beta and the beta of the market, industry, or peer group. How much weight is given to the company and historical beta depends on the statistical significance of the company beta statistic. If a company beta has a low standard error, then it will have a higher weighting in the Vasicek formula. If a company beta has a high standard error, then it will have lower weighting in the Vasicek formula. An advantage of this adjustment methodology is that it does not force an adjustment to the market as a whole. Instead, the adjustment can be toward an industry or some other peer group. This is most useful in looking at companies in industries that on average have high or low betas.[125]

Thus, the Vasicek adjustment method is statistically more accurate and is the preferred method to use when analyzing companies in an industry that has inherently low betas, such as the utility industry. The Vasicek method was also confirmed by Gombola, who conducted a study

[125] 2012 Ibbotson Stocks, Bonds, Bills, and Inflation Valuation Yearbook 78 (Morningstar 2012).

specifically related to utility companies. Gombola concluded that "[t]he strong evidence of auto-regressive tendencies in utility betas lends support to the application of adjustment procedures such as the . . . adjustment procedure presented by Vasicek."[126] Gombola also concluded that adjusting raw betas toward the market mean of 1.0 is too high, and that "[i]nstead, they should be adjusted toward a value that is less than one."[127] In conducting the Vasicek adjustment on betas in previous cases, it reveals that utility betas are even lower than those published by Value Line.[128] Gombola's findings are particular important here, because his study was conducted specifically on utility companies. This evidence indicates that using Value Line's betas in a CAPM cost of equity estimate for a utility company may lead to overestimated results. Regardless, adjusting betas to a level that is higher than Value Line's betas is not reasonable, and it would produce CAPM cost of equity results that are too high.

[126] Michael J. Gombola and Douglas R. Kahl, *Time-Series Processes of Utility Betas: Implications for Forecasting Systematic Risk* 92 (Financial Management Autumn 1990) (emphasis added).

[127] Michael J. Gombola and Douglas R. Kahl, *Time-Series Processes of Utility Betas: Implications for Forecasting Systematic Risk* 91–92 (Financial Management Autumn 1990) (emphasis added).

[128] *See e.g.,* Responsive Testimony of David J. Garrett, filed March 21, 2016, in Cause No. PUD 201500273 before the Corporation Commission of Oklahoma (OG&E's 2015 rate case), at pp. 56–59.

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EDUCATION

University of Oklahoma — Norman, OK
Master of Business Administration — 2014
Areas of Concentration: Finance, Energy

University of Oklahoma College of Law — Norman, OK
Juris Doctor — 2007
Member, American Indian Law Review

University of Oklahoma — Norman, OK
Bachelor of Business Administration — 2003
Major: Finance

PROFESSIONAL DESIGNATIONS

Society of Depreciation Professionals
Certified Depreciation Professional (CDP)

Society of Utility and Regulatory Financial Analysts
Certified Rate of Return Analyst (CRRA)

The Mediation Institute
Certified Civil / Commercial & Employment Mediator

WORK EXPERIENCE

Resolve Utility Consulting PLLC — Oklahoma City, OK
Managing Member — 2016 – Present
Provide expert analysis and testimony specializing in depreciation and cost of capital issues for clients in utility regulatory proceedings.

Oklahoma Corporation Commission — Oklahoma City, OK
Public Utility Regulatory Analyst — 2012 – 2016
Assistant General Counsel — 2011 – 2012
Represented commission staff in utility regulatory proceedings and provided legal opinions to commissioners. Provided expert analysis and testimony in depreciation, cost of capital, incentive compensation, payroll and other issues.

Perebus Counsel, PLLC — Oklahoma City, OK
Managing Member — 2009 – 2011
Represented clients in the areas of family law, estate planning, debt negotiations, business organization, and utility regulation.

Moricoli & Schovanec, P.C. — Oklahoma City, OK
Associate Attorney — 2007 – 2009
Represented clients in the areas of contracts, oil and gas, business structures and estate administration.

TEACHING EXPERIENCE

University of Oklahoma — Norman, OK
Adjunct Instructor – "Conflict Resolution" — 2014 – Present
Adjunct Instructor – "Ethics in Leadership"

Rose State College — Midwest City, OK
Adjunct Instructor – "Legal Research" — 2013 – 2015
Adjunct Instructor – "Oil & Gas Law"

PUBLICATIONS

American Indian Law Review — Norman, OK
"Vine of the Dead: Reviving Equal Protection Rites for Religious Drug Use" — 2006
(31 Am. Indian L. Rev. 143)

VOLUNTEER EXPERIENCE

Calm Waters — Oklahoma City, OK
Board Member — 2015 – 2018
Participate in management of operations, attend meetings, review performance, compensation, and financial records. Assist in fundraising events.

Group Facilitator & Fundraiser — 2014 – 2018
Facilitate group meetings designed to help children and families cope with divorce and tragic events. Assist in fundraising events.

St. Jude Children's Research Hospital — Oklahoma City, OK
Oklahoma Fundraising Committee — 2008 – 2010
Raised money for charity by organizing local fundraising events.

PROFESSIONAL ASSOCIATIONS

Oklahoma Bar Association 2007 – Present

Society of Depreciation Professionals 2014 – Present
Board Member – President 2017
Participate in management of operations, attend meetings, review performance, organize presentation agenda.

Society of Utility Regulatory Financial Analysts 2014 – Present

SELECTED CONTINUING PROFESSIONAL EDUCATION

Society of Depreciation Professionals Austin, TX
"Life and Net Salvage Analysis" 2015
Extensive instruction on utility depreciation, including actuarial and simulation life analysis modes, gross salvage, cost of removal, life cycle analysis, and technology forecasting.

Society of Depreciation Professionals New Orleans, LA
"Introduction to Depreciation" and "Extended Training" 2014
Extensive instruction on utility depreciation, including average lives and net salvage.

Society of Utility and Regulatory Financial Analysts Indianapolis, IN
46th Financial Forum. "The Regulatory Compact: Is it Still Relevant?" 2014
Forum discussions on current issues.

New Mexico State University, Center for Public Utilities Santa Fe, NM
Current Issues 2012, "The Santa Fe Conference" 2012
Forum discussions on various current issues in utility regulation.

Michigan State University, Institute of Public Utilities Clearwater, FL
"39th Eastern NARUC Utility Rate School" 2011
One-week, hands-on training emphasizing the fundamentals of the utility ratemaking process.

New Mexico State University, Center for Public Utilities Albuquerque, NM
"The Basics: Practical Regulatory Training for the Changing Electric Industries" 2010
One-week, hands-on training designed to provide a solid foundation in core areas of utility ratemaking.

The Mediation Institute Oklahoma City, OK
"Civil / Commercial & Employment Mediation Training" 2009
Extensive instruction and mock mediations designed to build foundations in conducting mediations in civil matters.

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Indiana Utility Regulatory Commission	Southern Indiana Gas Company, d/b/a Vectren Energy Delivery of Indiana, Inc.	45447	Depreciation rates, service lives, net salvage	Indiana Office of Utility Consumer Counselor
Public Utility Commission of Texas	Southwestern Public Service Company	PUC 51415	Depreciation rates, service lives, net salvage	Cities Advocating Reasonable Deregulation
New Mexico Public Regulatory Commission	Avangrid, Inc., Avangrid Networks, Inc., NM Green Holdings, Inc., PNM, and PNM Resources	20-00222-UT	Ring fencing and capital structure	The Albuquerque Bernalillo County Water Utility Authority
Indiana Utility Regulatory Commission	Indiana Gas Company, d/b/a Vectren Energy Delivery of Indiana, Inc.	45468	Depreciation rates, service lives, net salvage	Indiana Office of Utility Consumer Counselor
Public Utilities Commission of Nevada	Nevada Power Company and Sierra Pacific Power Company, d/b/a NV Energy	20-07023	Construction work in progress	MGM Resorts International, Caesars Enterprise Services, LLC, and the Southern Nevada Water Authority
Massachusetts Department of Public Utilities	Boston Gas Company, d/b/a National Grid	D.P.U. 20-120	Depreciation rates, service lives, net salvage	Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy
Public Service Commission of the State of Montana	ABACO Energy Services, LLC	D2020.07.082	Cost of capital and authorized rate of return	Montana Consumer Counsel
Maryland Public Service Commission	Washington Gas Light Company	9651	Cost of capital and authorized rate of return	Maryland Office of People's Counsel
Florida Public Service Commission	Utilities, Inc. of Florida	20200139-WS	Cost of capital and authorized rate of return	Florida Office of Public Counsel
New Mexico Public Regulatory Commission	El Paso Electric Company	20-00104-UT	Cost of capital, depreciation rates, net salvage	City of Las Cruces and Doña Ana County
Public Utilities Commission of Nevada	Nevada Power Company	20-06003	Cost of capital, awarded rate of return, capital structure, earnings sharing	MGM Resorts International, Caesars Enterprise Services, LLC, Wynn Las Vegas, LLC, Smart Energy Alliance, and Circus Circus Las Vegas, LLC
Wyoming Public Service Commission	Rocky Mountain Power	20000-578-ER-20	Cost of capital and authorized rate of return	Wyoming Industrial Energy Consumers
Florida Public Service Commission	Peoples Gas System	20200051-GU 20200166-GU	Cost of capital, depreciation rates, net salvage	Florida Office of Public Counsel
Wyoming Public Service Commission	Rocky Mountain Power	20000-539-EA-18	Depreciation rates, service lives, net salvage	Wyoming Industrial Energy Consumers

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Public Service Commission of South Carolina	Dominion Energy South Carolina	2020-125-E	Depreciation rates, service lives, net salvage	South Carolina Office of Regulatory Staff
Pennsylvania Public Utility Commission	The City of Bethlehem	2020-3020256	Cost of capital, awarded rate of return, capital structure	Pennsylvania Office of Consumer Advocate
Railroad Commission of Texas	Texas Gas Services Company	GUD 10928	Depreciation rates, service lives, net salvage	Gulf Coast Service Area Steering Committee
Public Utilities Commission of the State of California	Southern California Edison	A.19-08-013	Depreciation rates, service lives, net salvage	The Utility Reform Network
Massachusetts Department of Public Utilities	NSTAR Gas Company	D.P.U. 19-120	Depreciation rates, service lives, net salvage	Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy
Georgia Public Service Commission	Liberty Utilities (Peach State Natural Gas)	42959	Depreciation rates, service lives, net salvage	Public Interest Advocacy Staff
Florida Public Service Commission	Florida Public Utilities Company	20190155-EI 20190156-EI 20190174-EI	Depreciation rates, service lives, net salvage	Florida Office of Public Counsel
Illinois Commerce Commission	Commonwealth Edison Company	20-0393	Depreciation rates, service lives, net salvage	The Office of the Illinois Attorney General
Public Utility Commission of Texas	Southwestern Public Service Company	PUC 49831	Depreciation rates, service lives, net salvage	Alliance of Xcel Municipalities
Public Service Commission of South Carolina	Blue Granite Water Company	2019-290-WS	Depreciation rates, service lives, net salvage	South Carolina Office of Regulatory Staff
Railroad Commission of Texas	CenterPoint Energy Resources	GUD 10920	Depreciation rates and grouping procedure	Alliance of CenterPoint Municipalities
Pennsylvania Public Utility Commission	Aqua Pennsylvania Wastewater	A-2019-3009052	Fair market value estimates for wastewater assets	Pennsylvania Office of Consumer Advocate
New Mexico Public Regulation Commission	Southwestern Public Service Company	19-00170-UT	Cost of capital and authorized rate of return	The New Mexico Large Customer Group; Occidental Permian
Indiana Utility Regulatory Commission	Duke Energy Indiana	45253	Cost of capital, depreciation rates, net salvage	Indiana Office of Utility Consumer Counselor

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Maryland Public Service Commission	Columbia Gas of Maryland	9609	Depreciation rates, service lives, net salvage	Maryland Office of People's Counsel
Washington Utilities & Transportation Commission	Avista Corporation	UE-190334	Cost of capital, awarded rate of return, capital structure	Washington Office of Attorney General
Indiana Utility Regulatory Commission	Indiana Michigan Power Company	45235	Cost of capital, depreciation rates, net salvage	Indiana Office of Utility Consumer Counselor
Public Utilities Commission of the State of California	Pacific Gas & Electric Company	18-12-009	Depreciation rates, service lives, net salvage	The Utility Reform Network
Oklahoma Corporation Commission	The Empire District Electric Company	PUD 201800133	Cost of capital, authorized ROE, depreciation rates	Oklahoma Industrial Energy Consumers and Oklahoma Energy Results
Arkansas Public Service Commission	Southwestern Electric Power Company	19-008-U	Cost of capital, depreciation rates, net salvage	Western Arkansas Large Energy Consumers
Public Utility Commission of Texas	CenterPoint Energy Houston Electric	PUC 49421	Depreciation rates, service lives, net salvage	Texas Coast Utilities Coalition
Massachusetts Department of Public Utilities	Massachusetts Electric Company and Nantucket Electric Company	D.P.U. 18-150	Depreciation rates, service lives, net salvage	Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy
Oklahoma Corporation Commission	Oklahoma Gas & Electric Company	PUD 201800140	Cost of capital, authorized ROE, depreciation rates	Oklahoma Industrial Energy Consumers and Oklahoma Energy Results
Public Service Commission of the State of Montana	Montana-Dakota Utilities Company	D2018.9.60	Depreciation rates, service lives, net salvage	Montana Consumer Counsel and Denbury Onshore
Indiana Utility Regulatory Commission	Northern Indiana Public Service Company	45159	Depreciation rates, grouping procedure, demolition costs	Indiana Office of Utility Consumer Counselor
Public Service Commission of the State of Montana	NorthWestern Energy	D2018.2.12	Depreciation rates, service lives, net salvage	Montana Consumer Counsel
Oklahoma Corporation Commission	Public Service Company of Oklahoma	PUD 201800097	Depreciation rates, service lives, net salvage	Oklahoma Industrial Energy Consumers and Wal-Mart
Nevada Public Utilities Commission	Southwest Gas Corporation	18-05031	Depreciation rates, service lives, net salvage	Nevada Bureau of Consumer Protection

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Public Utility Commission of Texas	Texas-New Mexico Power Company	PUC 48401	Depreciation rates, service lives, net salvage	Alliance of Texas-New Mexico Power Municipalities
Oklahoma Corporation Commission	Oklahoma Gas & Electric Company	PUD 201700496	Depreciation rates, service lives, net salvage	Oklahoma Industrial Energy Consumers and Oklahoma Energy Results
Maryland Public Service Commission	Washington Gas Light Company	9481	Depreciation rates, service lives, net salvage	Maryland Office of People's Counsel
Indiana Utility Regulatory Commission	Citizens Energy Group	45039	Depreciation rates, service lives, net salvage	Indiana Office of Utility Consumer Counselor
Public Utility Commission of Texas	Entergy Texas, Inc.	PUC 48371	Depreciation rates, decommissioning costs	Texas Municipal Group
Washington Utilities & Transportation Commission	Avista Corporation	UE-180167	Depreciation rates, service lives, net salvage	Washington Office of Attorney General
New Mexico Public Regulation Commission	Southwestern Public Service Company	17-00255-UT	Cost of capital and authorized rate of return	HollyFrontier Navajo Refining; Occidental Permian
Public Utility Commission of Texas	Southwestern Public Service Company	PUC 47527	Depreciation rates, plant service lives	Alliance of Xcel Municipalities
Public Service Commission of the State of Montana	Montana-Dakota Utilities Company	D2017.9.79	Depreciation rates, service lives, net salvage	Montana Consumer Counsel
Florida Public Service Commission	Florida City Gas	20170179-GU	Cost of capital, depreciation rates	Florida Office of Public Counsel
Washington Utilities & Transportation Commission	Avista Corporation	UE-170485	Cost of capital and authorized rate of return	Washington Office of Attorney General
Wyoming Public Service Commission	Powder River Energy Corporation	10014-182-CA-17	Credit analysis, cost of capital	Private customer
Oklahoma Corporation Commission	Public Service Co. of Oklahoma	PUD 201700151	Depreciation, terminal salvage, risk analysis	Oklahoma Industrial Energy Consumers
Public Utility Commission of Texas	Oncor Electric Delivery Company	PUC 46957	Depreciation rates, simulated analysis	Alliance of Oncor Cities

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Nevada Public Utilities Commission	Nevada Power Company	17-06004	Depreciation rates, service lives, net salvage	Nevada Bureau of Consumer Protection
Public Utility Commission of Texas	El Paso Electric Company	PUC 46831	Depreciation rates, interim retirements	City of El Paso
Idaho Public Utilities Commission	Idaho Power Company	IPC-E-16-24	Accelerated depreciation of North Valmy plant	Micron Technology, Inc.
Idaho Public Utilities Commission	Idaho Power Company	IPC-E-16-23	Depreciation rates, service lives, net salvage	Micron Technology, Inc.
Public Utility Commission of Texas	Southwestern Electric Power Company	PUC 46449	Depreciation rates, decommissioning costs	Cities Advocating Reasonable Deregulation
Massachusetts Department of Public Utilities	Eversource Energy	D.P.U. 17-05	Cost of capital, capital structure, and rate of return	Sunrun Inc.; Energy Freedom Coalition of America
Railroad Commission of Texas	Atmos Pipeline - Texas	GUD 10580	Depreciation rates, grouping procedure	City of Dallas
Public Utility Commission of Texas	Sharyland Utility Company	PUC 45414	Depreciation rates, simulated analysis	City of Mission
Oklahoma Corporation Commission	Empire District Electric Company	PUD 201600468	Cost of capital, depreciation rates	Oklahoma Industrial Energy Consumers
Railroad Commission of Texas	CenterPoint Energy Texas Gas	GUD 10567	Depreciation rates, simulated plant analysis	Texas Coast Utilities Coalition
Arkansas Public Service Commission	Oklahoma Gas & Electric Company	160-159-GU	Cost of capital, depreciation rates, terminal salvage	Arkansas River Valley Energy Consumers; Wal-Mart
Florida Public Service Commission	Peoples Gas	160-159-GU	Depreciation rates, service lives, net salvage	Florida Office of Public Counsel
Arizona Corporation Commission	Arizona Public Service Company	E-01345A-16-0036	Cost of capital, depreciation rates, terminal salvage	Energy Freedom Coalition of America
Nevada Public Utilities Commission	Sierra Pacific Power Company	16-06008	Depreciation rates, net salvage, theoretical reserve	Northern Nevada Utility Customers

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Oklahoma Corporation Commission	Oklahoma Gas & Electric Co.	PUD 201500273	Cost of capital, depreciation rates, terminal salvage	Public Utility Division
Oklahoma Corporation Commission	Public Service Co. of Oklahoma	PUD 201500208	Cost of capital, depreciation rates, terminal salvage	Public Utility Division
Oklahoma Corporation Commission	Oklahoma Natural Gas Company	PUD 201500213	Cost of capital, depreciation rates, net salvage	Public Utility Division

Office of Regulatory Staff
Proxy Group Summary
Palmetto Wastewater Reclamation, Inc.
Docket No. 2021-153-S

Company	Ticker	Market Cap. ($ millions)	Market Category	Value Line Safety Rank	Financial Strength
American States Water Co	AWR	3,000	Mid Cap	2	A
American Water Works Co Inc	AWK	28,600	Large Cap	3	B++
Artesian Resources Corp.	ARTNA	361	Small Cap	3	B+
California Water Service Gp	CWT	2,900	Mid Cap	3	B++
Essential Utilities, Inc.	WTRG	11,000	Large Cap	3	B+
Middlesex Water Co	MSEX	1,500	Small Cap	2	B++
SJW Corp	SJW	1,900	Small Cap	3	B+
York Water Co	YORW	600	Small Cap	3	B+

Value Line Investment Survey

Office of Regulatory Staff
DCF Stock and Index Prices
Palmetto Wastewater Reclamation, Inc.
Docket No. 2021-153-S

Ticker	^GSPC	AWR	AWK	ARTNA	CWT	WTRG	MSEX	SJW	YORW
30-day Average	4444	89.27	176.72	38.85	63.34	49.17	105.26	68.63	49.65
Standard Deviation	43.7	1.96	5.81	0.55	1.46	0.71	4.48	0.90	1.44
07/22/21	4367	84.77	163.86	37.70	59.40	47.15	94.86	65.93	47.26
07/23/21	4412	86.18	166.70	38.18	60.51	48.38	96.10	67.46	47.69
07/26/21	4422	86.04	165.62	38.63	60.71	48.51	96.21	67.54	47.56
07/27/21	4401	86.86	169.62	38.73	61.28	49.30	98.31	67.78	47.74
07/28/21	4401	87.21	169.77	38.59	61.35	49.46	99.03	67.51	48.00
07/29/21	4419	87.89	170.15	38.92	62.52	49.38	100.99	68.53	48.36
07/30/21	4395	87.96	169.53	38.83	62.46	48.85	101.48	68.60	48.26
08/02/21	4387	88.32	171.66	39.28	63.02	49.20	103.63	68.65	48.43
08/03/21	4423	88.76	174.70	39.49	64.03	49.38	106.05	69.02	48.70
08/04/21	4403	89.88	175.87	39.43	64.39	49.55	106.68	69.32	49.20
08/05/21	4429	91.10	179.06	39.93	65.59	50.87	109.80	70.54	49.93
08/06/21	4437	90.34	176.85	39.70	64.78	50.23	108.17	69.38	49.87
08/09/21	4432	89.42	177.12	39.22	64.16	49.75	105.71	68.75	49.20
08/10/21	4437	88.81	176.01	39.14	64.13	49.38	105.83	68.99	49.31
08/11/21	4442	87.91	175.56	39.26	63.78	48.85	105.30	68.12	49.27
08/12/21	4461	88.37	177.45	38.40	63.65	48.63	106.18	68.09	49.22
08/13/21	4468	89.49	178.92	39.18	64.43	49.27	108.86	68.67	49.34
08/16/21	4473	90.51	181.50	38.89	65.10	49.57	108.67	68.94	50.18
08/17/21	4448	90.21	181.39	38.47	64.74	49.34	106.68	69.03	49.77
08/18/21	4400	89.26	179.88	38.23	63.89	48.85	105.17	68.01	49.84
08/19/21	4406	90.09	181.77	38.21	63.84	48.80	106.26	68.66	50.29
08/20/21	4442	91.40	184.10	37.88	64.36	49.13	107.79	69.36	51.51
08/23/21	4480	90.59	182.20	38.85	63.79	48.44	107.99	68.93	51.75
08/24/21	4486	89.32	180.60	38.94	63.15	48.71	108.01	68.56	51.45
08/25/21	4496	89.09	180.88	38.55	63.16	48.76	107.93	68.59	51.17
08/26/21	4470	89.81	181.22	38.20	62.95	48.65	107.33	68.46	50.08
08/27/21	4509	90.44	180.31	38.51	63.00	48.71	107.11	68.51	50.61
08/30/21	4529	92.10	182.58	39.25	63.73	49.96	109.64	69.16	50.99
08/31/21	4523	92.21	182.25	39.41	63.55	49.63	109.41	69.33	51.57
09/01/21	4524	93.85	184.43	39.47	64.90	50.40	112.52	70.61	53.09

All prices are adjusted closing prices reported by Yahoo! Finance, http://finance.yahoo.com

Office of Regulatory Staff

EXHIBIT DJG-4

DCF Dividend Yields

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Company	Ticker	[1] Dividend	[2] Stock Price	[3] Dividend Yield
American States Water Co	AWR	0.365	89.27	0.41%
American Water Works Co Inc	AWK	0.603	176.72	0.34%
Artesian Resources Corp.	ARTNA	0.261	38.85	0.67%
California Water Service Gp	CWT	0.230	63.34	0.36%
Essential Utilities, Inc.	WTRG	0.268	49.17	0.55%
Middlesex Water Co	MSEX	0.273	105.26	0.26%
SJW Corp	SJW	0.340	68.63	0.50%
York Water Co	YORW	0.187	49.65	0.38%
Average		**$0.32**	**$80.11**	**0.43%**

[1] 2021 Q3 reported quarterly dividends per share. Nasdaq.com

[2] Average stock price from Exhibit DJG-3

[3] = [1] / [2] (quarterly dividend yield)

Office of Regulatory Staff

EXHIBIT DJG-5

DCF Terminal Growth Rate Determinants

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Terminal Growth Determinants	Rate	
Nominal GDP	3.8%	[1]
Real GDP	1.8%	[2]
Inflation	2.0%	[3]
Projected Growth Rate	6.3%	[4]
Risk Free Rate	1.9%	[5]
Highest	**6.3%**	

[1],[2] [3] CBO, The 2021 Long-Term Budget Outlook, p. 34

[4] I/B/E/S growth rate from Exhibit PRM-1, Sch. 9

[5] From Exhibit DJG-7

Office of Regulatory Staff
DCF Final Results
Palmetto Wastewater Reclamation, Inc.
Docket No. 2021-153-S

[1]	[2]	[3]	[4]
Dividend (d_0)	Stock Price (P_0)	Growth Rate (g)	**DCF Result**
$0.32	$80.11	6.31%	**8.0%**

[1] Average proxy dividend from Exhibit DJG-4

[2] Average proxy stock price from Exhibit DJG-3

[3] Highest growth determinant from Exhibit DJG-5

[4] Quarterly DCF Approximation = $[d_0(1 + g)^{0.25}/P_0 + (1 + g)^{0.25}]^4 - 1$

Office of Regulatory Staff

EXHIBIT DJG-7

CAPM Risk-Free Rate

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Date	Rate
07/22/21	1.90%
07/23/21	1.92%
07/26/21	1.93%
07/27/21	1.89%
07/28/21	1.90%
07/29/21	1.91%
07/30/21	1.89%
08/02/21	1.86%
08/03/21	1.85%
08/04/21	1.83%
08/05/21	1.86%
08/06/21	1.94%
08/09/21	1.96%
08/10/21	1.99%
08/11/21	1.99%
08/12/21	2.03%
08/13/21	1.94%
08/16/21	1.92%
08/17/21	1.92%
08/18/21	1.91%
08/19/21	1.88%
08/20/21	1.87%
08/23/21	1.87%
08/24/21	1.91%
08/25/21	1.96%
08/26/21	1.94%
08/27/21	1.91%
08/30/21	1.90%
08/31/21	1.92%
09/01/21	1.92%
Average	**1.91%**

*Daily Treasury Yield Curve Rates on 30-year T-bonds, http://www.treasury.gov/resources-center/data-chart-center/interest-rates/

Office of Regulatory Staff

EXHIBIT DJG-8

CAPM Beta Coefficient

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Company	Ticker	Beta
American States Water Co	AWR	0.65
American Water Works Co Inc	AWK	0.85
Artesian Resources Corp.	ARTNA	0.75
California Water Service Gp	CWT	0.65
Essential Utilities, Inc.	WTRG	0.95
Middlesex Water Co	MSEX	0.70
SJW Corp	SJW	0.80
York Water Co	YORW	0.85
Average		0.78

Betas from Value Line Investment Survey

Office of Regulatory Staff
CAPM Implied Equity Risk Premium Estimate
Palmetto Wastewater Reclamation, Inc.
Docket No. 2021-153-S

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Year	Market Value	Operating Earnings	Dividends	Buybacks	Earnings Yield	Dividend Yield	Buyback Yield	Gross Cash Yield
2015	17,900	885	382	572	4.95%	2.14%	3.20%	5.33%
2016	19,268	920	397	536	4.77%	2.06%	2.78%	4.85%
2017	22,821	1,066	420	519	4.67%	1.84%	2.28%	4.12%
2018	21,027	1,282	456	806	6.10%	2.17%	3.84%	6.01%
2019	26,760	1,305	485	729	4.88%	1.81%	2.72%	4.54%
2020	31,659	1,019	480	520	3.22%	1.52%	1.64%	3.16%
Cash Yield	4.67%	[9]						
Growth Rate	2.85%	[10]						
Risk-free Rate	1.91%	[11]						
Current Index Value	4,444	[12]						

	[13]	[14]	[15]	[16]	[17]
Year	1	2	3	4	5
Expected Dividends	213	219	226	232	239
Expected Terminal Value					4906
Present Value	200	192	185	178	3690
Intrinsic Index Value	4444	[18]			
Required Return on Market	6.9%	[19]			
Implied Equity Risk Premium	**5.0%**	[20]			

[1-4] S&P Quarterly Press Releases, data found at https://us.spindices.com/indices/equity/sp-500, Q4 2018
[1] Market value of S&P 500
[5] = [2] / [1]
[6] = [3] / [1]
[7] = [4] / [1]
[8] = [6] + [7]
[9] = Average of [8]
[10] = Compound annual growth rate of [2] = (end value / beginning value)$^{1/4}$-1
[11] Risk-free rate from DJG-1-7
[12] 30-day average of closing index prices from DJG-1-3 (^GSPC column)
[13-16] Expected dividends = [9]*[12]*(1+[10])^{n} ; Present value = expected dividend / (1+[11]+[19])^{n}
[17] Expected terminal value = expected dividend * (1+[11]) / [19] ; Present value = (expected dividend + expected terminal value) / (1+[11]+[19])^{n}
[18] = Sum([13-17]) present values.
[19] = [20] + [11]
[20] Internal rate of return calculation setting [18] equal to [12] and solving for the discount rate

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EXHIBIT DJG-10

CAPM Equity Risk Premium Results

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

IESE Business School Survey	5.6%	[1]
Duff & Phelps Report	5.5%	[2]
Damodaran (average)	4.8%	[3]
Garrett	5.0%	[4]
Average	**5.2%**	
Highest	**5.6%**	

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EXHIBIT DJG-11

CAPM Final Result

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

[1]	[2]	[3]	[4]
Risk-Free Rate	Proxy Beta	Risk Premium	**CAPM Result**
1.91%	0.775	5.6%	**6.3%**

[1] From DJG-7, risk-free rate exhibit

[2] From DJG-8, beta exhibit (avg. beta of proxy group)

[3] From DJG-10, equity risk premium exhibit

[4] = [1] + [2] * [3]

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EXHIBIT DJG-12

Cost of Equity Summary

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Model	Cost of Equity
Discounted Cash Flow Model	8.0%
Capital Asset Pricing Model	6.3%
Average	**7.1%**

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EXHIBIT DJG-13

Market Cost of Equity vs. Awarded Returns

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

	[1]		[2]		[3]		[4]	[5]	[6]	[7]
	Electric Utilities		Gas Utilities		Total Utilities		S&P 500	T-Bond	Risk	Market
Year	ROE	#	ROE	#	ROE	#	Returns	Rate	Premium	COE
1990	12.70%	38	12.68%	33	12.69%	71	-3.06%	8.07%	3.89%	11.96%
1991	12.54%	42	12.45%	31	12.50%	73	30.23%	6.70%	3.48%	10.18%
1992	12.09%	45	12.02%	28	12.06%	73	7.49%	6.68%	3.55%	10.23%
1993	11.46%	28	11.37%	40	11.41%	68	9.97%	5.79%	3.17%	8.96%
1994	11.21%	28	11.24%	24	11.22%	52	1.33%	7.82%	3.55%	11.37%
1995	11.58%	28	11.44%	13	11.54%	41	37.20%	5.57%	3.29%	8.86%
1996	11.40%	18	11.12%	17	11.26%	35	22.68%	6.41%	3.20%	9.61%
1997	11.33%	10	11.30%	12	11.31%	22	33.10%	5.74%	2.73%	8.47%
1998	11.77%	10	11.51%	10	11.64%	20	28.34%	4.65%	2.26%	6.91%
1999	10.72%	6	10.74%	6	10.73%	12	20.89%	6.44%	2.05%	8.49%
2000	11.58%	9	11.34%	13	11.44%	22	-9.03%	5.11%	2.87%	7.98%
2001	11.07%	15	10.96%	5	11.04%	20	-11.85%	5.05%	3.62%	8.67%
2002	11.21%	14	11.17%	19	11.19%	33	-21.97%	3.81%	4.10%	7.91%
2003	10.96%	20	10.99%	25	10.98%	45	28.36%	4.25%	3.69%	7.94%
2004	10.81%	21	10.63%	22	10.72%	43	10.74%	4.22%	3.65%	7.87%
2005	10.51%	24	10.41%	26	10.46%	50	4.83%	4.39%	4.08%	8.47%
2006	10.32%	26	10.40%	15	10.35%	41	15.61%	4.70%	4.16%	8.86%
2007	10.30%	38	10.22%	35	10.26%	73	5.48%	4.02%	4.37%	8.39%
2008	10.41%	37	10.39%	32	10.40%	69	-36.55%	2.21%	6.43%	8.64%
2009	10.52%	40	10.22%	30	10.39%	70	25.94%	3.84%	4.36%	8.20%
2010	10.37%	61	10.15%	39	10.28%	100	14.82%	3.29%	5.20%	8.49%
2011	10.29%	42	9.92%	16	10.19%	58	2.10%	1.88%	6.01%	7.89%
2012	10.17%	58	9.94%	35	10.08%	93	15.89%	1.76%	5.78%	7.54%
2013	10.03%	49	9.68%	21	9.93%	70	32.15%	3.04%	4.96%	8.00%
2014	9.91%	38	9.78%	26	9.86%	64	13.52%	2.17%	5.78%	7.95%
2015	9.85%	30	9.60%	16	9.76%	46	1.38%	2.27%	6.12%	8.39%
2016	9.77%	42	9.54%	26	9.68%	68	11.77%	2.45%	5.69%	8.14%
2017	9.74%	53	9.72%	24	9.73%	77	21.61%	2.41%	5.08%	7.49%
2018	9.64%	37	9.62%	26	9.63%	63	-4.23%	2.68%	5.96%	8.64%
2019	9.64%	67	9.71%	32	9.66%	99	31.22%	1.92%	5.20%	7.12%
2020	9.43%	43	9.46%	34	9.44%	77	18.01%	0.93%	4.72%	5.65%

[1], [2], [3] Average annual authorized ROE for electric and gas utilities, RRA Regulatory Focus: Major Rate Case Decisions

[3] = [1] + [2]

[4], [5], [6] Annual S&P 500 return, 10-year T-bond Rate, and equity risk premium published by NYU Stern School of Business

[7] = [5] + [6] ; Market cost of equity represents the required return for investing in all stocks in the market for a given year

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EXHIBIT DJG-14

Proxy Company Debt Ratios

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Company	Ticker	Debt Ratio
American States Water Co	AWR	47%
American Water Works Co Inc	AWK	59%
Artesian Resources Corp.	ARTNA	46%
California Water Service Gp	CWT	46%
Essential Utilities, Inc.	WTRG	54%
Middlesex Water Co	MSEX	44%
SJW Corp	SJW	58%
York Water Co	YORW	46%
Average		50%

Debt ratios from Value Line Investment Survey

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EXHIBIT DJG-15

Competitive Industry Debt Ratios

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Industry	# Firms	Debt Ratio
Financial Svcs. (Non-bank & Insurance)	235	95%
Retail (Building Supply)	15	88%
Hospitals/Healthcare Facilities	32	84%
Air Transport	17	84%
Advertising	61	81%
Hotel/Gaming	66	77%
Brokerage & Investment Banking	39	77%
Auto & Truck	19	75%
Retail (Automotive)	30	74%
Food Wholesalers	18	74%
Retail (Special Lines)	85	72%
Recreation	69	71%
Bank (Money Center)	7	68%
Retail (Grocery and Food)	14	68%
Transportation	21	68%
Computers/Peripherals	52	68%
Packaging & Container	26	67%
Broadcasting	29	65%
Rubber& Tires	3	64%
Beverage (Soft)	41	64%
Chemical (Basic)	48	62%
Oil/Gas Distribution	57	62%
Cable TV	13	61%
R.E.I.T.	238	61%
Apparel	51	61%
Trucking	35	61%
Computer Services	116	61%
Retail (Distributors)	85	60%
Telecom (Wireless)	16	60%
Power	55	60%
Farming/Agriculture	32	59%
Business & Consumer Services	169	59%
Aerospace/Defense	72	59%
Telecom. Services	58	59%
Retail (Online)	75	58%
Utility (General)	16	58%
Software (Internet)	36	57%
Household Products	140	57%
Construction Supplies	46	57%
Real Estate (Operations & Services)	61	56%
Building Materials	42	56%
Transportation (Railroads)	6	56%
Coal & Related Energy	29	56%
Chemical (Diversified)	5	56%
Office Equipment & Services	22	55%
Environmental & Waste Services	86	54%
Auto Parts	52	53%
Drugs (Biotechnology)	547	52%
Real Estate (Development)	25	52%
Publishing & Newspapers	29	52%
Green & Renewable Energy	25	52%
Retail (General)	17	52%
Shoe	11	50%
Total / Average	**3,194**	**64%**

http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/dbtfund.htm

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EXHIBIT DJG-16

Weighted Average Rate of Return Proposal

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Capital Component	Proposed Ratio	Cost Rate	Weighted Cost
Debt	50.0%	3.79%	1.90%
Common Equity	50.0%	8.90%	4.45%
Total	100.0%		6.35%

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EXHIBIT DJG-17

Hamada Model

Palmetto Wastewater Reclamation, Inc.

Docket No. 2021-153-S

Unlevering Beta

Proposed Debt Ratio	40%	[1]
Proposed Equity Ratio	60%	[2]
Debt / Equity Ratio	67%	[3]
Tax Rate	21%	[4]
Equity Risk Premium	5.6%	[5]
Risk-free Rate	1.9%	[6]
Proxy Group Beta	0.78	[7]
Unlevered Beta	0.51	[8]

Relevered Betas and Cost of Equity Estimates

[9] Debt Ratio	[10] D/E Ratio	[11] Levered Beta	[12] Cost of Equity
0%	0%	0.507	4.75%
20%	25%	0.607	5.31%
30%	43%	0.679	5.71%
40%	67%	0.774	6.25%
50%	100%	0.908	7.00%
55%	122%	0.997	7.50%
60%	150%	1.108	8.12%

[1] Company debt ratio

[2] Company equity ratio

[3] = [1] / [2]

[4] Tax rate

[5] Equity risk premium from Exhibit DJG-11

[6] Risk-free rate from Exhibit DJG-11

[7] Average proxy beta from Exhibit DJG-11

[8] = [7] / (1 + (1 - [4]) * [3])

[9] Various debt ratios for modeling

[10] = [9] / (1 - [9])

[11] = [8] * (1 + (1 - [4]) * [10])

[12] = [6] + [11] * [5]